# WHATS COOKING?
# A MIXED METHODS ANALYSIS OF COOKING PERCEPTIONS, PRACTICES AND THE IMPLICATIONS FOR FOOD POLICY

by,
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## ABSTRACT

Substantial changes in the food system over the past century have dramatically altered the way Americans eat. As food preparation habits have shifted toward an emphasis on speed and convenience, Americans have come to rely more on foods away from home and convenience foods. However, cooking remains an important part of American life and evidence suggests that frequent cooking is associated with a healthier diet. Similar to the nutrition transition taking place due to the influence of the modern, western food system and the diet it promotes, a "culinary transition" is changing the way people approach food preparation and the skills they need to prepare food and consume a healthy diet. Americans cook less frequently and spend less time cooking than in the past; evidence suggests that traditional or "scratch" cooking, cooking knowledge, skills and confidence have declined. The culinary transition has also shifted perceptions of what cooking is, though little is known about the extent to which the meaning of cooking has evolved or how it may differ among Americans.

This dissertation, presented in three manuscripts, explores how Americans perceive and practice cooking, how Americans learn to cook, and public support for school and government programs to teach people cooking skills. This dissertation uses qualitative data collected from focus groups conducted in Baltimore, and quantitative primary data collected via a nationally representative, web-based survey. Manuscript 1 uses focus group data to explore cooking knowledge, practice and perceptions among residents of Baltimore City. Manuscript 2 reports results from the national survey on how Americans perceive the meaning of cooking and how these perceptions are related to cooking confidence, attitudes and behavior. Finally, Manuscript 3 uses both focus group

and survey data to explore how Americans learn to cook and public support for cooking education policies and programs.

Perceptions of what it means to cook vary considerably and span a continuum from all scratch cooking to anything made at home. Perceptions of cooking incorporate considerations of the degree to which scratch ingredients, convenience foods and heat are used. Cooking behavior among adults in the United States varies somewhat depending on how they perceive cooking, and cooking confidence and enjoyment is lowest among Americans who perceive cooking as including the use of convenience foods. Most American adults learned to cook from their parents (primarily mothers) and very few report learning to cook through formal instruction in school or cooking classes; however, approximately two-thirds of Americans support requiring cooking education in public schools.

Cooking is a complex concept and is not uniformly understood. Policies and programs seeking to encourage healthy cooking at home should consider the broad spectrum of activities Americans recognize as cooking as well as the barriers and facilitators to preparing food at home on a daily basis. The way in which people interpret the meaning of cooking has implications for how the public health field measures cooking behavior, and for how we understand the relationships between cooking, at home food consumption, diet quality, and health outcomes. A greater understanding of how people learn to cook, the barriers they face in how they cook in their every day lives as well as strategies frequent cooks employ that enable them to prepare food at home is necessary for the development of effective interventions that seek to reduce barriers to and encourage healthy cooking at home.

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# CHAPTER 1. INTRODUCTION

In the United States, substantial changes in agricultural production and distribution over the past century have dramatically altered the food system resulting in a highly concentrated, industrialized system with distribution across the globe [1,2]. As the modern food system has developed, some foods and methods of cooking have remained constant, while new foods and methods of cooking have been introduced [3]. The invention of refrigeration, electric stoves and ovens, microwaves and dishwashers have expanded the methods of cooking that are available and have made food preparation and clean up faster and more efficient. New foods have also emerged. Processed, packaged "convenience" foods, virtually unheard of prior to the 1950s are now ubiquitous [4]. These and other developments have altered the possibilities for what the act of cooking can be. For home cooks, cooking, and answering questions about cooking, is anything but straightforward [5,6]. In short, there is cooking, and then there is *cooking.* In a busy, modern world, cooking is complex, and how it is practiced depends on one's ability and skills, resources (time and money), confidence, enjoyment, and the emotions and values associated with cooking, the foods being used, and meal being prepared [5,6].

In recent decades, primarily due to rapidly rising obesity rates [7,8], a robust literature has examined food choices, consumption patterns and the health consequences associated with various foods and beverages [9-18]. In addition to consumption, the public health consequences of the way we produce food are also widely studied [19-21]. Research on food preparation (the intermediate step between production and consumption), namely cooking practices, knowledge, values, beliefs and the contemporary meaning of home

cooking is notable in its relative absence from the literature. What literature does exist, has focused outside of the United States [5,6,22-25], and the extent to which findings from foreign countries can be generalized to the United States is unknown.

The amount of time Americans spend cooking has declined since the 1960's [26], yet in recent national surveys Americans report cooking very frequently, an average of five nights per week [27,28]. These national surveys ask about cooking generally, and do not define the term further. This raises the question of what people mean when they say they are cooking, and how the meaning of cooking is understood. In response to the health consequences of increased consumption of fast foods and other foods consumed away from home [14,29,30], and the perceived decline of cooking skills and knowledge among amateur cooks, home cooking is beginning to be promoted as an obesity prevention measure spurring the development of cooking classes and cooking education in schools and community programs [31-40]. However, research on how Americans cook, how they learn to cook, and how they understand the meaning of cooking has been missing from the literature. This dissertation addresses these gaps by examining American's beliefs about activities that qualify as cooking, how Americans learn to cook and public support for policies to teach cooking in schools and in the Supplemental Nutrition Assistance Program.

## Public health significance

Results from this study fill several gaps in the literature important for understanding American's food choices, and with implications for efforts to curb obesity and improve the food system. First, though Americans consume half of all calories in the home and report cooking frequently, the food system and food environment has changed

significantly over the past several decades, and no research to date has examined whether or how American's concept of cooking may have changed as well. Second, this research provides more detailed information than currently exists regarding types of foods Americans prepare at home and the context in which people make decisions about what and how to prepare food in their daily lives. Third, the study sheds light onto how people learn to cook, and public support for policies related to cooking education.

Foods prepared at home increasingly rely on processed, convenience foods [41]. Dietary intake is frequently stratified by foods consumed at home versus foods consumed away from home. Given the prevalence of highly processed, pre-packaged convenience and ready to eat foods, the gap in nutritional quality between foods away from home and foods at home may be narrowing, and research that provides a more detailed understanding of foods prepared at home is needed [41,42]. The public health literature on cooking is sparse, though food preparation is a key component of how the food system functions and is an important step in shaping food choices and consumption with implications for diet quality and obesity (see **Appendix A**). In addition, the fact that we don't currently have a good understanding about what people are referring to when they respond to survey questions about cooking is a serious limitation in research studying cooking attitudes, behavior and diet related health outcomes [27,43].

With home cooking receiving increasing attention as an obesity prevention measure [31,32], and greater emphasis beginning to be placed on diet composition rather than total calories consumed [44] a more developed understanding of how Americans cook, how they learn to cook, and how they think about cooking is essential for the development of policies, interventions and effective messaging of public health

campaigns. The way in which people cook, and the way in which they perceive cooking has implications for the development and feasibility of cooking education and public health initiatives that emphasize cooking more/differently in order to consume a healthier diet [45]. While numerous school and community based cooking education interventions have been implemented in recent years [46,47], more knowledge is needed about where or how Americans learn to cook, and about public support for school or community based policies and programs to develop cooking skills in children and adults.

## Study aims and approach

The overarching aim of this research is to examine the relationships among cooking confidence, attitudes, behavior and perceptions of what it means "to cook," in order to understand how cooking is perceived, and how that perception may vary across population subgroups. This dissertation also explored how people learn to cook and public support for developing cooking skills in two settings- public schools and through the Supplemental Nutrition Assistance Program. The specific aims are the following:

> Aim 1: Understand how cooking is perceived and practiced among Baltimore City residents.
>
> Aim 2: Examine cooking perceptions and practices among a nationally representative sample of U.S. adults.
>
> Aim 3: Explore how people learn to cook and public support for cooking related policies.

## Conceptual Framework

This research used an ecological framework (shown in **Appendix B**) to understand the multiple and interrelated influences that shape cooking perceptions, practices and the acquisition of cooking knowledge and skills at the individual level.

Ecological frameworks are widely used to describe the factors that influence individual health behaviors in a variety of contexts, including healthy lifestyles, food choices and the causes of obesity [48,49]. The Institute of Medicine (IOM) uses an ecological framework for their childhood and adult obesity work [50] and the Centers for Disease Control and Prevention (CDC) use a conceptual framework to guide their Healthy People 2020 work [51]. As healthy eating is one component of the causal framework for obesity and food preparation/cooking is one element important for healthy eating, an ecological framework provides an appropriate model through which to view this dissertation research.

In the 1970s in an effort to account for the complex and dynamic environmental influences on individual behavior, Urie Brofenbrenner developed an early ecological conceptual framework, which has since evolved and has been widely adapted [52,53]. Ecological frameworks have been applied to a variety of phenomena in the field of public health, as they can flexibly and comprehensively allow for understanding multiple levels of influence on individual behavior and view behavior as both being affected by multiple influences, and in turn effecting those same influences [54,55]. Implicit within an ecological framework is the conclusion that a combination of both individual level and environmental/policy level interventions are necessary to achieve substantive health behavior change [55].

In the case of this dissertation, perceptions of cooking and cooking behavior are influenced by individual factors such as age, gender, socio-economic status, time pressures, taste preferences, and values around food [30,48,56-59]. These individual factors are closely tied to other interpersonal factors, most specifically family cooking habits and

food preferences [60,61]. Cooking knowledge, skills and behavior for both individuals and families are shaped by the physical built environment, the community culture, norms and values, and the accessibility of affordable, quality food in the communities in which people live [11,62-67]. All of these can influence the intergenerational transfer of cooking skills within the family context. Individual and family cooking knowledge and behavior while being influenced by community factors, also play a role in determining the norms and values in the community, and due to the dynamics of supply and demand, help to shape the food environment in which food purchasing decisions are made. Cooking education also takes place at the community level, either in schools or in other classes offered by various groups in community [37,68,69]. However, the need for these programs of the nature of the curriculums that they teach may be influenced by factors at the individual and family levels.

The broadest sphere of influence, most removed from the individual, is the general culture and policy landscape. The food and beverage industry, restaurant industry, and the media play a large role in shaping cooking and eating preferences and behavior through the messages they convey, the products they offer and the prices at which they offer them [70-74]. Policies at this level include local, state and federal policies such as SNAP and WIC as well as nutrition education curricula and school wellness policies. Zoning policies and efforts to increase access to healthy foods are common strategies in the efforts to reduce obesity and promote healthy eating, but in an example of the bi-directional flow of influence, if the target population of such policies lack the food preparation skills to make use of scratch ingredients and fresh produce, the effectiveness of said policies may be limited.

## Overview of Chapters

Following this introductory chapter, the relevant literature is reviewed in Chapter 2. Chapter 3 presents an overview of the data collection and analysis methods used in all three manuscripts. The first manuscript, entitled "*What does cooking mean to you?: Perceptions of cooking and factors related to cooking behavior*" is presented in Chapter 4. This manuscript addresses Aim 1 and uses focus groups and a grounded theory analytic approach to explore how cooking is perceived and practiced in a small sample of Baltimore City adults. Chapter 5 presents the results from a nationally representative web-based survey that addressed the second aim by examining perceptions of cooking and how those perceptions are related to cooking confidence, attitudes and behavior. This manuscript is entitled: "*Public perceptions of cooking and the implications for cooking behavior in the United States."* The third aim is addressed using mixed methods that take advantage of qualitative data from the focus groups on how people learn to cook and where they see opportunities for encouraging healthy cooking and quantitative data from the survey on the same subject. This manuscript is entitled "*Perspectives on learning to cook and public support for cooking education policies in the United States: A mixed methods study*" and is presented in Chapter 6. Finally, Chapter 7 discusses the implications and conclusions that follow from this dissertation as a whole and presents recommendations for policy and future research.

# CHAPTER 2. LITERATURE REVIEW

## Declining frequency and time spent cooking in the United States

Americans cook less frequently and spend less time cooking now than in the past [26,75]. Data from The American Time Use Survey (ATUS) indicate that in 2006-2008, 53.6% of Americans engaged in any meal preparation [76]. In 2007 the National Health and Examination Survey (NHANES) began asking about cooking practices by including a question measuring household frequency of cooking dinner [77]. Overall, Americans reported living in households where dinner was cooked an average of 5 nights per week and over half of American household always cooked dinner at home (6-7 times per week) [27]. Data from the following survey wave (2009-2010) are similar [78] and are consistent with earlier estimates of cooking frequency from telephone polls conducted between 1997 and 2011 (see **Appendix C**).

Self-reported household cooking frequency varies significantly across socio-economic status (SES), with households with lower SES more likely to cook dinner either very frequently or not at all and higher SES households more likely to cook sometimes [27]. There are also differences in household cooking frequency by race, with households where the surveyed person is Black cooking the least frequently (4.4 dinners per week), and Hispanics cooking the most frequently (5.6 dinners per week) [27]. Households where the surveyed person is white cooked dinner 5.0 times per week [27]. Cooking frequency also varies by age and household composition. Younger respondents are more likely to live in households where dinner was never cooked and households where the respondent lived with a partner or dependents were more likely to cook very frequently [27].

Overall, Americans report that they live in households where dinner is cooked frequently, however on an individual level, Americans spend less time preparing meals (defined as food and drink preparation, presentation and clean up) than ever before [75]. Since 1975, the time women spend in preparing meals has declined by 40 minutes from 92 minutes per day to 51 minutes per day [75]. This decline reflects a longer-term trend. In the 1950's, women spent about the same amount of time doing housework as they did in the 1920's, however, they spent much less time cooking than in the 1920's [3]. In 1926, women spent about 23 hours per week, or 3.3 hours per day, preparing meals [3,75]. By the late 1950's women prepared meals about 17-18 hours per week, or 2.5 hours per day [3]. By 1968 women spent about 2 hours per day preparing meals [75]. Cooking has traditionally been the domain of women [79], and this remains true today. In 2006-2008, more women spent any time in meal preparation on an average day than men (67.1% vs. 39.2%) and among those who prepared meals, women also spent more time doing so than men (69.5 minutes vs. 46.8 minutes) [76]. Women are also much more likely to be the primary grocery shopper (72.9% vs. 32.3%) and meal preparer (73.4% vs. 29.7%) than men [76].

Differences in individual cooking frequency and time spent cooking occur by age with younger Americans about half as likely to spend time preparing food during an average day than older Americans (30.6% of 18-24 year olds vs. 61.0% of those 65 or older) [76]. Americans ≥65 years old who prepared meals also spend about 20 minutes more time doing so than 18-24 year olds (68.1 minutes vs. 49.5 minutes). Women's entrance into the workforce is often cited as a causal factor in declining rates of home cooking [75,80-83]. Evidence confirms that employment status, and particularly female

employment, is associated with decreased time spent in food preparation [84]. Employed individuals are less likely to cook, and when they do, spend less time cooking than unemployed individuals [76]. Having a partner or children in the household associated with increased time spent cooking though less so for women working full time [84]. Across the income spectrum, individuals cook with relatively similar frequency [76,84], however low income individuals (<185% of the federal poverty line (FPL)) spend more time preparing meals than high income (>185% FPL) [76]. Low-income women who work full time also spend more time cooking than their higher income counterparts [84]. This trend is similar for participants in the Supplemental Nutrition Assistance Program (SNAP), though it varies by the household composition of SNAP participants [84,85].

## Increasing consumption of convenience foods and foods away from home

One plausible explanation for the decreasing time spent cooking is the introduction of thousands of new "convenience foods" beginning in the 1950s [3]. Convenience foods are "any fully or partially prepared foods in which significant preparation time, culinary skills or energy inputs have been transferred from the home kitchen to the food processor and distributor" [86]. Convenience foods are less time consuming to prepare and require less mental effort to be devoted to meal planning [87]. Thus, convenience foods respond to consumer demand for easy, fast meals due to time-constrained lifestyles and increased female workforce participation [4,83,87-89]. While time constraints (perceived or real) are an important motivator for convenience foods use, it should be noted that the food industry is not merely responding to consumer demand for convenience foods, but that industry played an active role in creating that demand in an effort to sell their new frozen and processed/packaged products starting in the 1950's [3]. It

should also be noted, that decreased time spent cooking and increased use of convenience foods is often attributed to the busy, time-constrained modern lifestyle, but over the same period in which these declines have been documented, time spent in leisure activities and in watching television and (more recently) on computers and the Internet specifically has increased substantially [90].

Convenience foods are now ubiquitous in the marketplace, and 90% of Americans purchase convenience foods [91]. Americans spend a growing proportion of their grocery expenditures on packaged and processed food. Spending on these convenience foods increased 3.2% between 1998 and 2006 to almost 20% of all food expenditures [92]. By comparison, spending on fruits and vegetables over the same period fell by 1.4% and each comprise less than 10% of total food spending [92]. Convenience products have been so widely incorporated into daily life that home cooks often take advantage of convenience products when preparing meals [4,87]. Convenience foods have been incorporated into all stages of preparing meals, not only in 'everyday' cooking, but when preparing special occasion meals as well [4,93]. A study in Switzerland found that convenience products were used to the same extent regardless of how much time one spends cooking [93]. Convenience foods are used as a time saving technique, and to allow individual preferences of multiple members of a household to be satisfied without creating a lot of extra work [4]. They also remove the need for certain skills or the need to perform unpleasant or labor intensive tasks [4,86].

In addition to increasing spending on and consumption of convenience foods, foods away from home (FAFH) have become an increasingly important part of American's diet [42]. FAFH include table-service restaurants, fast-food restaurants, and

take-out or delivery meals eaten at home [42]. In 1953, Americans spent 25% of their food expenditures on FAFH, over the years, that number has steadily risen such that in 2012, Americans spent 50% of their food expenditures on FAFH [94]. The share of daily energy intake from FAFH has increased as well, from 18% in 1977-78 to 32% in 2005-2008 [42,95]. FAFH are of lower nutritional quality than foods prepared at home, and are higher in fat, calories, sodium, and sugar [42]. Fast food restaurants are especially associated with food of poor nutritional quality, and account for a large share of the increase in calories, fat, sodium and sugar from FAFH over the past few decades. [42,95-97]. The share of energy intake from FAFH in general, and fast-food specifically, has increased for all age groups since the 1970s [95]. This trend is likely due to both increasing energy density and larger portion sizes for FAFH as well as increasing frequency of consumption [95,98].

## A culinary transition

As the food system has changed, cooking has also evolved from an act that involved almost exclusively raw or scratch ingredients to one that could still involve exclusively scratch ingredients, but could also involve some of the thousands of convenience food products available on the market today [93,99]. As this transition has taken place, there is a general consensus that the skills and knowledge necessary to cook foods from scratch have declined (traditional cooking skills), creating a culinarily "de-skilled" population, especially among younger people [45]. One study of young adults found that actual food preparation knowledge was low, as was cooking confidence, and that while participants had generally positive attitudes about cooking, they viewed "scratch" cooking negatively [100]. Other studies find little difference in cooking skills and behavior between older and younger women, indicating a more general decline [61,101]. As in the past,

most people report learning how to cook at home, usually from their mothers, though as food preparation habits and norms shifted, the inter-generational transmission of traditional cooking skills has eroded [43,100-102].

While traditional cooking skills have declined, so have the other knowledge and skills necessary to prepare foods for consumption. Lang and Caraher named this fundamental cultural shift a "culinary transition" [103]. Similar to the nutrition transition taking place due to the development of the modern, western food system and the diet it promotes [104,105] the culinary transition is changing the way people approach food preparation, and the skills they need to prepare food [5,6,22,45,103,106]. Much of the literature on cooking skills defines cooking skills in the traditional sense (skills necessary to prepare foods from basic (not pre-packaged/prepared) ingredients [93]. However, Short, Lang, Caraher and others argue that this view of cooking skills is too narrow and that the skills important for preparing food are more complex and diverse than being able to perform specific kitchen tasks [22,99,106,107]. In fact, cooking skills are part of a general food literacy, defined as "a collection of inter-related knowledge, skills and behaviors required to plan, manage, select, prepare and eat foods to meet needs and determine food intake" [108]. Cooking involves mechanical, technical, perceptual, conceptual, organizational, and academic skills [5]. These skills are all important for navigating the food environment, planning meals, following recipes, organizing one's time to make time for cooking, and of course, doing the cooking.

The relationship between cooking knowledge/skills and cooking behavior and attitudes is not straightforward. For example, lack of knowledge and skills does limit a person's ability to cook from scratch, but the choice of whether or not to cook or use

convenience products does not necessarily depend on one's level of cooking knowledge or skills. [103]. Lack of confidence in one's ability to perform basic cooking skills, and perceptions that cooking is work have been identified to be just as important barriers as actual knowledge and skills [61,100]. Time scarcity (perceived and real), the high value placed on convenience, and lack of interest or enjoyment of cooking have been identified as other barriers to cooking separate from knowledge and skills [86,87,93]. Perhaps more than actual skills, one's general approach to cooking, beliefs about cooking, self-identification as "a cook" and confidence (or lack thereof) are all important determinants of cooking habits [5]. In addition to the above, the high cost of and lack of access to high quality, fresh ingredients are additional barriers to cooking especially for low-income populations [62,109].

The culinary transition has also shifted perceptions of what it means to cook [45,103]. Studies conducted outside of the United States show that people differentiate between different kinds of cooking- everyday or special occasion cooking, home cooking or proper cooking or just plain cooking, scratch cooking or not, real cooking or just putting a meal on the table, cooking for pleasure or cooking because you have to [3,5,6,61]. In their effort to market convenience foods, the food industry worked hard to change perceptions of what cooking is [3,110]. This was done to cast cooking as work, and too time consuming for modern life and simultaneously change the perception of "homemade" to include convenience food products [3,88]. Widespread use of convenience products in the home suggests that industry has been successful on one front, however the extent that the general public truly embraces these products as actual cooking or thinks of them as homemade varies [4].

The terms ‘homemade’, ‘convenience’ and ‘proper cooking’ have multiple meanings for different people [4]. Even the terms ‘cook’, ‘basic ingredients’ and ‘ready prepared’ are ambiguous and are interpreted differently by different people [5,22]. The extent to which the meaning of ‘cooking’ or ‘homemade’ differ systematically is largely unknown, though one study found generational and gender differences in perceptions of how homemade food is defined [88]. Moisio found that younger people incorporate convenience foods into their definition of homemade to a much greater extent than older people who emphasize ‘cooking from scratch’, using natural ingredients, and tradition into their definition of homemade [88]. The evolving definition and perception of cooking and the lack of clarity regarding what people are doing and the products they are using when they say they are cooking is an often cited limitation in studies examining cooking skills and behavior [26,27,43,111,112].

## Food skills acquisition

Decreases in time spent cooking at home, and the increasing role convenience foods and foods away from home in the typical Americans diet may have reduced prevalence and use of cooking knowledge and skills in the general population, particularly among younger generations [43,111,113] [26,61,75,102,103,106]. Other evidence suggests cooking skills and knowledge among the public may actually be high [114], but that the cooking skills needed to navigate todays food system are more complex and may be different than in the past [22,103].

For centuries, cooking at home was the domain of women, and cooking skills were passed down from mothers and grandmothers to daughters. At the turn of the 20th century, soon after the introduction of the first convenience foods (dry cereals and

commercially available canned goods) and new appliances, cooking skills and nutrition began to be taught in public schools, almost exclusively to girls, through "home economics classes" [115]. In 1909 the American Home Economics Association was founded which, for the first time, took a scientific approach to the instruction and study of "domestic issues" [116]. The spread of home economics in public schools was facilitated by the United States Department of Agriculture's establishment of the Cooperative National Extension service [115]. By 1938, almost 90% of junior and senior high school girls took home economics classes [115]. These classes taught girls how to use modern, electric kitchen appliances (which were new to the market), and emphasized wise food management in order to feed a family using limited resources [115].

However, as convenience foods and kitchen appliances continued to advance, and as more women entered the workforce, home economics courses gradually shifted towards teaching women how to utilize new food industry products to prepare quick and easy meals [3,117]. The rise of feminism helped to politicize home economics and contributed to the gradual disappearance (aided by budget constraints and other resource constraints in schools as well as home economics teacher shortages) of required home economics in public schools [117]. By the 1990s, the few home economics courses still offered in schools were electives [68], though cooking knowledge and skills are sometimes included in nutrition curricula [68], The United States Department of Agriculture, the Centers for Disease Control, as well as the United States Department of Education fund a variety nutrition education programs and initiatives, often aimed at increasing fruit and vegetable preferences and consumption, relatively few of which emphasize hands-on, interactive cooking experiences [68,118,119].

In addition to home economics, the public sector has used several policies and programs to teach both children and adults how to cook. Since 1969, the Expanded Food and Nutrition Education Program (EFNEP) has provided low-income families with nutrition education aimed at addressing food insecurity, hunger, and, more recently, obesity [120]. EFNEP programs, which have increasingly focused on building cooking knowledge and skills, received $68 million in federal funding (in some cases supplemented by additional state and local funds) in fiscal year 2014 [121]. The education program associated with the Supplemental Nutrition Assistance Program (SNAP-Ed), which received $379 million in federal funding in 2010 [122], also focuses, in part, on encouraging home cooking and building cooking skills among participating families [123,124].

Despite this investment in cooking education through government programs and in some school-based interventions, limited evidence suggests that people, particularly women, typically learn to cook from their mothers and not in schools or other formal instruction and that, given shifts in cooking practices, this inter-generational transfer of cooking knowledge and skills may be diminishing [45,103]. A survey conducted in England in 1993, indicates that how people learn to cook varies based on gender and education with cooking classes being more important for individuals with low SES and cook books being used more frequently by higher educated individuals [45]. Whether these patterns currently hold true in the U.S. or after the proliferation cooking resources on the Internet and on television is unknown.

## The public health importance of cooking

"Food literacy is the scaffolding that empowers individuals, households, communities or nations to protect diet quality through change and support dietary resilience over time" [108]. Eroding food literacy, home cooking practices, and shifting perceptions of what cooking is have important implications for public health. FAFH and convenience foods have higher energy density and lower nutritional value than foods prepared using fresh ingredients and increased consumption of these foods is often identified as a contributor to rising obesity rates [9,14,30,97,125-127]. Declining cooking skills and food literacy are related, at least to some degree, to American's ever increasing consumption of convenience foods and FAFH [69]. Higher cooking skills and confidence are associated with less consumption of convenience foods and FAFH and with increased consumption of fresh fruits and vegetables [83,93,111,128]. Cooking skills are also associated with improved food security among low-income women in Montreal [129].

As discussed above, the relationship between cooking knowledge, skills and confidence (and food literacy broadly) and diet quality is not straightforward. Not all cooking is healthy cooking, and people who are skilled cooks do not always only cook with solely fresh ingredients. However, lack of cooking knowledge, skills or confidence is certainly a barrier to being able to cook 'from scratch' and increases a person's dependence on the food industry to dictate their food options [45,102,111,130]. Furthermore, evidence suggests that greater cooking frequency or more time spent cooking is, indeed, associated with better diet quality measured by total caloric intake, fat, sodium, sugar, and carbohydrates [30,111]. This is promising as new research suggests that overall diet

quality and composition may be more important than overall energy and fat intake for addressing obesity and other diet related diseases [44].

Cooking trends are also related to environmental health, food security, and the sustainability of local and regional food systems [110,129,131]. The connection between the food system (including the consumption choices of the public) and climate change is well described in the literature [21,132-135]. Among diet related carbon emissions, red meat production and huge mono-crop farming practices are primary contributors to climate change within the food system [132]. Modifying the public demand for higher emission products has been identified as a potentially effective way to exert pressure to improve unsustainable supply-side practices [20,21,131]. However, Americans' food preparation knowledge and skills may present a barrier to these efforts if low food literacy and shifting culinary values prevents people from making more sustainable food choices [110,136].

## Cooking related policy

In spite of the importance for population and environmental health, policy and programmatic interventions to shift American's eating behavior are just beginning to address the role of food preparation in determining consumption [27]. Food preparation, the intermediate step between production and consumption, has not been given its due in policy approaches to obesity or food systems issues [137]. Improving the food environment and increasing access to healthy foods (especially fresh fruits and vegetables) has been the focus of a number of interventions and policies [65,138-142]. This approach implicitly assumes that the target populations of these interventions are food literate enough and have the time, resources and desire to prepare these ingredients. Implementing

interventions designed to encourage healthy cooking, such as cooking skills classes, without addressing the other barriers people face (time, access, cost) will do little to improve diet related health outcomes [103,106]. However, implementing interventions to increase access or make healthy food items more affordable will also have limited impact if the general public is not food literate enough to execute all the steps necessary to cook that food [45].

While home economics classes have largely disappeared from American schools [68,69,117,143], in response to the obesity epidemic, nutrition classes have been implemented in recent years, as discussed above [32,39,144,145]. The Healthy, Hunger-free Kids Act mandated that schools have a "wellness plan" that includes nutrition education [146]. Though cooking classes have been proven to increase cooking confidence and diet quality [145,147,148], cooking skills education is generally not part of nutrition education in schools [69]. Similarly, nutrition education in the federal food assistance programs SNAP and the Women's Infant and Children Program (WIC), focuses more on nutrition knowledge than on building cooking knowledge and skills [123]. As the emphasis of SNAP and WIC has shifted from preventing hunger and malnutrition to ensuring program participants are able to consume a healthy diet, nutrition education has received increased funding and attention [123]. The first federally funded nutrition education programs for SNAP, eventually named SNAP-Ed, began in 1992 in seven states with total funding of $661,076 [122]. Since then there has been a steady increase in the number of states implementing nutrition education as well as the amount of money allocated to the program; in 2010 all 50 states had SNAP-Ed programs with approved federal funding of $379 million [122]. However, the extent to which this education includes cooking skills

education is limited [123]. SNAP benefits are based on the Thrifty Food Plan which assumes a substantial amount of time intensive home food (scratch) preparation, and many SNAP participants do not have enough time to spend in food preparation to prepare food in this manner [85].

Discourse regarding food system contributions to climate change recommends shifting individual's diets as a way to reduce food related green house gasses and waste [19,20,149]. Movements to encourage people to eat locally in order to support local food systems and small farmers have grown over the past decade, but they often identify cost as a barrier to lower income people purchasing fresh produce and local food [140]. However, recommendations to eat less meat or eat locally seem to be made without considering how cooking trends and food literacy may influence the public's ability and desire to make those adjustments to their diet [20,149].

# CHAPTER 3. METHODOLOGY

This study used mixed methods to explore how Americans perceive and practice cooking, how Americans learn to cook, and public support for cooking related policies. The nature of the research questions, the complexity of cooking as a construct, as well as the fact that this area was relatively unexplored in the literature made a mixed methods approach ideal. Mixed methods integrate both qualitative and quantitative data and take advantage of the strengths of each to answer the research questions at hand [150].

For this study, we began with qualitative data collected through focus groups. Participant recruitment and data collection was targeted and purposive and was informed by the social-ecological framework that guided the study design. Data analysis was guided by grounded theory [151] and used an inductive and iterative approach. These results then informed the development of a survey which was fielded in a nationally representative sample. Thus, the rich data yielded by the focus groups provided context and served as formative research that could then be subjected to factor analysis and hypothesis testing using the quantitative data generated from the survey. Finally, both focus group and survey data were compared using a mixed methods concurrent triangulation [150,152,153] approach to address the research question of how people learn to cook. Survey data was analyzed using multivariable regression and qualitative data provided detailed contextual information and texture to explain provide a depth of understanding for the quantitative results. Focus group results are reported in Manuscripts 1 and 3; survey results are reported in Manuscripts 2 and 3.

## Focus groups

Focus groups are a valuable method of data collection because they offer a unique opportunity to collect rich qualitative data resulting from a discussion around a specific topic of interest. Group discussions provide direct evidence about similarities and differences of opinions among participants, and allow the researcher to observe interactions among participants while still having a role in guiding the direction of the discussion [154]. For the purpose of this research, focus groups are an especially appropriate method of data collection due to the opportunity they provide to gain insight into complex behaviors and motivations [154], in this case conceptualizations of cooking, and food preparation knowledge, practices and behavior. Furthermore, focus groups are commonly used as a first step in the development of surveys because they allow the researcher to identify the various domains that should be measured and often provide item wording that will effectively convey the researcher's intent to survey respondents [154].

Unlike most quantitative research which prioritizes the elimination or minimization of potential bias through random selection of study participants, qualitative research often uses purposive sampling when recruiting potential study participants [152]. Focus groups in particular do not prioritize generalizability or representativeness of the group participants [154]. Rather, focus groups seek to achieve homogeneity among key participants groups that can inform the research questions to foster comfortable, free-flowing interaction and open sharing of ideas [154]. If it is of interest to the researcher to explore differences across groups, the sample can be segmented or stratified to achieve homogeneity within individual groups, but still allow for across-group comparisons. As this study was a preliminary step to inform the development of a survey to be

administered across a diverse population, several cross-group comparisons were of interest. In particular focus groups were segmented by income/food access and, for most groups, by gender.

***Sample selection and participant recruitment***

Study participants were recruited from two Baltimore area neighborhoods -- one with low income and limited food access and one with higher income and food access. The neighborhoods were purposefully sampled using the Maryland Food System Map developed and maintained by the Center for a Livable Future (CLF) at the Johns Hopkins Bloomberg School of Public Health. Primary inclusion criteria included 1) median income of the neighborhood; 2) food access determined by the number and type of food stores within the neighborhood; and 3) the logistical feasibility of recruiting participants and conducting the focus group sessions within those neighborhoods.

After the two neighborhoods were selected, the CLF Maryland Food System Map was used to identify all food stores (supermarkets, grocery stores, corner stores, WIC stores and farmers markets) in those neighborhoods. Fliers were posted at a random selection of those outlets, as well as at libraries and churches in the neighborhoods. In person recruitment was also conducted on several occasions. Fliers specified that we were interested in talking with people who "loved to cook, hated to cook, cooked all the time, or not at all".

Recruited individuals in each neighborhood were asked to sign up for one of seven focus groups (four in Neighborhood 1 (high income/food access) and three in Neighborhood 2 (low income/food access)) which were conducted between November 2014 and January 2015 in public use meeting rooms in libraries located within the

neighborhood. Participation was restricted to individuals over the age of 18 who lived in each neighborhood (based on self report).

### *Data collection*

Focus groups were conducted between November 2014 and January 2015. The group sessions were approximately 90 minutes long, and food was provided. Participants were asked to read and sign an informed consent document when they arrive for the focus groups. At this time, they were also asked to fill out a short survey to collect basic demographic and cooking frequency information. A discussion guide was developed and used to moderate all the groups. A note taker attended all focus groups and took notes on the discussion as well as tone of voice, facial expressions and gestures not captured by the audio recordings. Discussion began with an exploration of food preparation habits and history including everyday food preparation activities, where and how people learned about cooking and impressions of community norms about cooking. The discussion then moved on to how people perceive cooking, whether they distinguish between food preparation and cooking and if so, how those distinctions are made. Photographs of food products taken at a local grocery store were used to facilitate discussions and make comparisons about whether something would be considered cooking. The focus group discussions were audio recorded with the participants' permission. Participants were given a $40.00 gift card to a local drug store (CVS) in compensation for their time at the end of the session.

### *Data analysis*

Transcripts from the focus groups were transcribed verbatim, and were analyzed using an iterative and inductive coding process [155,156]. Data analysis utilized elements of grounded theory as outlined by Charmaz [151] and began while data collection was still ongoing. First, transcripts from all the focus groups were reviewed, and all topics raised by the participants were noted. Because data analysis began during the data collection process, the discussion guide was revisited and initial findings from early groups informed the discussion in later groups. Memos were also used to document my initial impressions, thought processes and reactions throughout data collection and analysis [157].

Formal coding of the seven focus group transcripts used the following process. First, line-by-line initial codes were applied to each transcript. These initial codes were short, specific and often used the focus group participant's own words. All seven transcripts were coded using line-by-line initial codes resulting in 188 initial codes. Next, focused codes were developed that represented emerging themes from the data. The transcripts were then returned to multiple times as these focused codes were applied and refined. A memo was written for each focused code that explored the concepts being captured by each code and included explanations, representative quotations, and reflections of the importance of the code and how it relates to other codes. Finally, focused codes were grouped into broad themes or categories that were used as an organizing tool through which the results could be understood. Throughout the coding process comparisons were made between focus groups, between neighborhoods, by participant characteristics. All data analysis was conducted using HyperResearch qualitative data analysis software.

### *Quality assurance and credibility*

Traditional principles of validity and reliability used in quantitative research are not generally applied to qualitative research, including research involving focus groups [154,158,159]. Rather, qualitative research tends to take a more constructivist epistemological approach, recognizing that both the researcher and the research participants come to a particular subject in a specific place and time, and with their own points of view and preconceptions [152]. For this research in particular, a social constructivist perspective is embedded within the research question itself, which seeks to explore how different people's perception of cooking is shaped. I also recognize that I come to this subject matter with my own history, perspective and biases. In recognition of this potential "researcher bias" I was mindful to craft discussion guides for the focus groups which are not overly influenced by my own perspective, and was careful during the focus group discussions to be open and reflexive. Memo writing during the data analysis, which I did, is a process that also provides an opportunity for reflexivity on the part of the researcher -- a process not necessarily aimed at eliminating bias, but rather at recognizing and confronting the particular perspective the researcher brings to the data [151].

Credibility is also a concern in qualitative research. Because the researcher is the "instrument" of analysis through which the results are interpreted, it is of upmost importance to take steps to ensure that the results and their interpretation are firmly grounded in the data [159]. Verbatim transcription and line-by-line coding of the transcripts was used to address credibility concerns. In addition, memo writing throughout the data analysis process provided an opportunity for reflexivity and a re-focusing of the research lens to ensure that the findings are grounded in the data themselves.

## Survey methods

The focus group findings directly informed the development of a survey to explore a similar set of questions among a larger, nationally representative sample. A survey was designed in collaboration with CLF and was administered on-line using GfK, an established survey research firm. The survey was a three-part survey, the first inquiring about cooking perceptions, confidence, attitudes and behavior, the second inquiring about meat consumption attitudes, preferences and behavior and the third measuring public support for implementation of Meatless Mondays and cooking related policies. The first and third sections of the survey were used as part of this dissertation.

### *Survey development*

The survey instrument was developed in collaboration with CLF and sought to generate new knowledge concerning meat consumption and cooking preferences, conceptualization and behavior. The meat consumption module will be used by CLF staff as part of a separate research project related to their Meatless Monday initiative. The survey was funded by a CLF directed research grant. Preliminary steps to draft the survey took place over a series of meetings during the summer of 2014, but the exact modules and question wording for the cooking section of the survey were not finalized until after the focus groups were completed in January 2015. At that time, the draft survey was revised to incorporate the focus group initial findings. The survey was reviewed by several content area experts and was piloted multiple times by the study team before being pilot tested in the field. The survey was fielded in April 2015.

***Sample selection and data collection***

The survey was fielded using the GfK survey research firm's KnowledgePanel [160]. This GfK panel is commonly used for survey research, published in several high profile journals, to generate nationally representative estimates of attitudes and behaviors across a wide array of academic fields [161-164]. GfK uses address-based sampling (without replacement), from the U.S. Postal Service's Delivery Sequence File to recruit a panel of approximately 55,000 non-volunteer (participants must be randomly selected to participate and cannot volunteer of their own accord) adults who participate in two to four surveys per month [160]. Participants are recruited in both English and Spanish through mailings and telephone calls [160]. The sampling frame covers approximately 97% of U.S. households, including households with unlisted telephone numbers, without landlines, and households without computers or internet access [160]. Households without computers or internet access are given a computer and an internet connection from GfK [160]. The average survey completion rate for GfK surveys using this panel is 65% [160]. Recruitment for the KnowledgePanel begins as an equal probability sample and then sample weights are computed in several stages to correct for any biases in sampling or non-response [160]. GfK uses the most recent demographic distribution data from the Current Population Survey (CPS) to create base weights for members of the panel. After the final sample is drawn and all data are collected, study-specific post-stratification weights are constructed, starting with each panel member's base weight, through an iterative ranking procedure to ensure that final sample is representative [160].

This survey has an N of 1,112 completed surveys, and a completion rate of 73%. The target sample size was determined by budget constraints, however power

calculations indicated power was sufficient to detect meaningful differences in the outcomes of interest between demographic subgroups. The survey was fielded among 1,568 GfK Panel members (aged ≥18 years), of whom 1,137 completed the 53-item survey. The median survey completion time was 16 minutes. Twenty-four individuals who completed the survey in <4 minutes were excluded; resulting in a final sample size of 1,112 and a survey completion rate of 73%. Question and response order was randomized within certain groups of questions to avoid priming. GfK does not provide incentives or payments for surveys that take less than 16 minutes to complete, so respondents were be offered any payment or incentive for their participation. GfK delivered the data completely de-identified with study specific survey weights which were used in analysis to produce nationally representative results.

***Demographic measures***

GfK collects a range of baseline demographic characteristics from all panel participants including age, education, income, race, household size, and employment. In addition, GfK collects information on political party affiliation, and on region of residence. Some of these variables are available for no additional cost to the researcher eliminating the need to inquire about these characteristics in the actual survey instrument. In addition, purchased additional background variables that GfK maintains for the panel members including zip code, BMI, other health conditions, parent status, and whether the respondent is the primary food shopper.

***Cooking measures***

The survey included 18 statements on cooking to assess the way in which respondents perceive cooking. These questions encompass five general thematic areas: 1)

specific foods or ingredients, 2) specific equipment or activities, 3) use of convenience products, 4) time or difficulty, 5) use of heat. These themes were identified based on prior literature [4,5] and based results from the Aim 1 focus groups. Each statement started with the same introduction: "There are many ways to prepare meals. Below are some examples of different ways people prepare meals. Indicate how strongly you agree or disagree that the following activities are cooking. There are no right or wrong answers." Then, respondents read the phrase, "I would say I have cooked if I…." followed by descriptions of different combinations food preparation activities and ingredients or products. For example, respondents were if they would say they had cooked if they "used boiling water to make pasta or noodles with sauce from a jar," if they "chopped vegetables to make a salad and used a store-bought salad dressing" or if they "made something in the microwave using mostly scratch or fresh ingredients."

Confidence and attitudes about cooking were also measured. All questions will be measured on seven-point Likert scales from strongly disagree to strongly agree, or in the case of cooking confidence, from "not at all confident" to "extremely confident". Participants were asked how confident they were that they could cook from scratch using fresh ingredients, follow a recipe, and cook a healthy meal. Respondents were asked about both positive and negative attitudes about cooking. To assess positive attitudes, respondents were asked how strongly they agreed or disagreed that they enjoy cooking, cooking helps them eat healthfully, they are a good cook, cooking is important to them, and cooking makes them happy. To assess negative attitudes, respondents were asked whether they feel that cooking takes too much time, costs too much, is a burden or chore, or is stressful.

To understand cooking behavior, we measured the number of times per week the respondent or someone in their household reported cooking breakfast, lunch and dinner as well as the frequency of cooking meals using scratch/fresh ingredients (such as fresh vegetables or raw meats), packaged/boxed ingredients (such as products that include flavor packets and dried pasta or rice but that require additional ingredients (such as butter or milk) and need to be heated), frozen products (such as frozen vegetables, fish or meat), and recipes. We also measured the frequency of consuming home cooked leftovers for breakfast, lunch and dinner. Responses ranged from 0 to ≥7.

We also asked survey respondents about how they learned to cook. Respondents were shown the stem "I learned to cook from…" followed by 14 potential sources of cooking skills/knowledge presented in randomized order. Respondents could respond either yes or no to each. We then grouped these 14 items into the following sources of acquiring cooking information: 1) mom or dad (asked about separately); 2) friend/relative or spouse (friend/spouse/partner, grandmother, other relative); 3) taught self (taught myself, trial and error); 4) cookbooks or websites (cookbooks, recipe websites); 5) cooking shows; 6) in school or cooking class (school or cooking class). For example, "mom or dad" was coded as 1 if respondents answered "yes" to either mom or dad, and was coded as 0 if they answered "no" to both mom and dad. Respondents were also asked whether they learned to cook from some other means or whether they didn't know how to cook/didn't learn from anyone.

***Responsibility attributions and policy support***

Respondents were asked how much responsibility they believe the government, the food industry, schools, or parents and other relatives/family members have for

teaching children how to cook. Responses were recorded on a 7-point Likert scale from 1 for "hardly any" to 7 for "a great deal". Attributions of responsibility were examined across the full distribution of the scale and using dichotomous measures coded as 1 if the respondents answered ≥5 and 0 if they chose ≤4.

Support for three cooking related policies was measured on a 7-point Likert scale from 1 for "strongly oppose" to 7 for "strongly support". Respondents viewed the policies in randomized order. The policy statements were the following: 1) require cooking skills to be taught as part of standard health education in public schools; 2) require public schools to offer home economics classes to teach students how to cook and shop for healthy food; and 3) increase funding for cooking classes for people receiving SNAP, or food stamps, which is a government program to help low-income families buy food. Dichotomous variables indicating support for each policy were created and coded as 1 if respondents answered ≥5 (somewhat support, support or strongly support) and 0 if they chose ≤4 (strongly oppose, oppose, somewhat oppose or neither support or oppose).

***Data analysis***

We used factor analysis to identify thematic areas (or factors) related to perceptions of cooking. Factor analysis is a statistical method and data reduction technique that uses measured or observed variables to derive a (usually) smaller number of unmeasured or unobserved, underlying factors [165,166]. The values of the observed variables that are correlated with or "load onto" each factor can be combined to create a single score that represents the unobserved factor. First, we performed a principal components analysis followed by exploratory factor analysis using an oblique rotation and polychoric correlation matrix on the 18-item set of cooking perception statements.

We extracted 3 factors, described below. A scree plot and parallel analysis confirmed the extraction of 3 factors. Four items were dropped because they had low factor loadings (<0.5) or high uniqueness (>0.5). We averaged the responses to the questions that loaded onto each factor and created dichotomous indicators of agreement (i.e., the factor was considered cooking) if the mean response of the items loading onto the factor was ≥5 (corresponding to three response categories: somewhat agree, agree, or strongly agree). We also measured cooking perceptions by combining the factors into one categorical variable with mutually exclusive categories. These cooking perception factors were used for analyses in both Manuscripts 2 and 3.

For Manuscript 2, we examined the percent of respondents who responded negatively (strongly disagree, disagree or somewhat disagree), no opinion, or positively (strongly agree, agree, or somewhat agree) to each of the 14 remaining cooking perception measures. Then, we used ordered logit multivariate models (and Poisson models for cooking behavior outcomes) to estimate the association between cooking perception factor indicators and cooking confidence, attitudes and behaviors adjusted for the covariates described above. The cooking perception factors indicators were included in the same model to isolate the association between each factor and the outcomes while accounting for correlation between the factors (i.e., whether the respondent also considered other factors be cooking). Finally, we used Poisson models to estimate the association between the mutually exclusive cooking perception categories and cooking behaviors. We used post estimation margins to estimate predicted mean cooking practices and behaviors for individuals in each of these cooking perception categories. For all

analyses socio-demographic covariates were included based on prior literature [10; 11; 36] regardless of statistical significance.

For Manuscript 3, we used multivariable logistic regression models to examine the associations between the socio-demographic covariates and the six sources of cooking information. The six learning to cook outcomes were modeled separately, and each one included the other five options as covariates in the model. Models also controlled for sex, age, race/ethnicity, education, household income, and perceptions of the meaning of cooking. All covariates were included regardless of significance based on prior literature [45,167]. We used post estimation margins to estimate the predicted sources of cooking information by gender and educational attainment. Next, we examined the unadjusted distribution of the responsibility attribution and policy support measures. We tested differences in responsibility attributions by gender and educational attainment using chi-squared tests. Finally, we used multivariable logistic regression to examine policy support adjusting for the socio-demographic covariates described above as well as responsibility attributions (using the full 7-point scale), and political party affiliation. We used post estimation margins commands to estimate predicted policy support for each policy overall and by gender, educational attainment, and political party affiliation. We used the focus group results to triangulate and provide context for the survey results.

All analyses were conducted with Stata, version 13 (Stata-Corp LP, College Station, TX) and used GfK provided survey weights to produce nationally representative estimates. Significance was assessed at $p<0.05$.

## Ethical review

The Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) approved this study.

# CHAPTER 4. WHAT DOES COOKING MEAN TO YOU?: PERCEPTIONS OF COOKING AND FACTORS RELATED TO COOKING BEHAVIOR

(Manuscript 1)


## Abstract

Despite the importance of cooking in American life and evidence suggesting that meals cooked at home are healthier, little is known about perceptions of what it means to cook in the United States. The objective of this study was to describe perceptions of cooking and factors important to how cooking is perceived and practiced among American adults. Seven focus groups (N = 53; 39 female; 35 Black, 16 White, 2 Asian) were conducted from November 2014 to January 2015 in Baltimore City, Maryland. Participants were recruited from two neighborhoods; one with higher median income and access to healthy food and the other with lower income and low access to healthy food. Focus groups were audio recorded, transcribed verbatim and analyzed using a grounded theory approach. Participants' perceptions of cooking varied considerably, regardless of neighborhood income or food access, and spanned a continuum from all scratch cooking to anything made at home. Perceptions of cooking incorporated considerations of whether or how food was heated and the degree of time, effort and love involved if convenience foods were used. Key barriers to cooking included affordability, lack of time, and lack of enjoyment. Key facilitators of frequent cooking included extensive organization and time management to enable participants to incorporate cooking into their daily lives. Cooking is a complex concept and not uniformly understood. Efforts to encourage healthy cooking

at home should consider the broad spectrum of activities Americans recognize as cooking as well as the barriers and facilitators to preparing food at home. Public health messages to encourage more frequent cooking should account for the heterogeneity in perspectives about cooking. More research should explore differences in perceptions about cooking in other diverse populations.

## Introduction

Despite the importance of cooking in American life, little is known about how Americans perceive cooking. The Oxford English Dictionary defines cooking as "to prepare food by the action of heat"[168]. However, limited evidence suggests that people interpret the meaning of cooking quite differently [5]. Moreover, the terms 'homemade', 'convenience', 'proper cooking', 'cook', 'basic ingredients' and 'ready prepared' are not uniformly understood [4,5,22]. In addition, most available studies have been conducted outside of the United States and may lack relevance to Americans [5,6,22-25]. Therefore, the meaning of cooking in the U.S. context is not well understood and this is an important limitation in studies examining cooking skills and behavior [26,27,43,111,112]. Improved knowledge in this area is important as greater frequency of cooking at home is associated with consumption of a healthier diet [78] particularly among households with higher income [169].

What is clear is that Americans cook less frequently and spend less time cooking now than in the past [26,75]. Yet, half of Americans still report engaging in meal preparation on a daily basis [76], and in a typical American household, dinner is reported as being cooked an average of 5 nights per week [27,78]. The frequency of cooking is associated with

a variety of socio-demographic characteristics [27]. Employment status, particularly female employment, is associated with decreased time spent cooking [84] while lower income (<185% of the poverty threshold) is associated with increased time spent cooking [76]. Younger individuals are less likely to cook. Among race/ethnic groups, frequency of cooking dinner is lower among Black households (4.4 days/week) and higher among Hispanic households (5.6 days/week) [27].

Reductions in the time available for cooking have been associated with an increased role for convenience foods in the American diet. Convenience foods, ("any fully or partially prepared foods in which significant preparation time, culinary skills or energy inputs have been transferred from the home kitchen to the food processor and distributor" [86]), are now ubiquitous in the marketplace, and 90% of Americans purchase convenience foods [91]. Approximately 20% of all food expenditures are spent on convenience foods compared to 10% for fruits and vegetables [92]. Although convenience foods have become common in the marketplace [45,103], are marketed as an essential component of a home-cooked meal [3], and are widely used [4], the extent to which the American public considers use of these products to be cooking is unknown. Furthermore, the extent to which the meaning of 'cooking' or 'homemade' differ systematically is unclear. Interestingly, one study found that younger people incorporate convenience foods into their definition of homemade to a much greater extent than older people who emphasize 'cooking from scratch', using fresh ingredients, and tradition into their definition of homemade [88].

The objective of this qualitative study is to examine American adults' perceptions of concepts related to cooking. The specific aims of this formative research are to: 1)

explore how individuals perceive what it means "to cook", and 2) describe factors that are important to how cooking is perceived and practiced. We used a social-ecological framework to inform the study design. Evidence suggests that perceptions of cooking and cooking behavior may be influenced by individual factors such as age, gender, socio-economic status, time pressures, taste preferences, and values around food [30,48,56-59]. These individual factors are closely tied to other interpersonal factors, most specifically family cooking habits and food preferences [60,61]. Cooking knowledge, skills and behavior for both individuals and families are shaped by the physical built environment, the community culture, norms and values, and the accessibility of affordable, quality food in the communities in which people live [11,62-67]. Individual and family cooking knowledge and behavior while being influenced by community factors, also play a role in determining the norms and values in the community, and due to the dynamics of supply and demand, help to shape the food environment in which food purchasing decisions are made. Thus, while we did not have specific hypotheses (due to the exploratory nature of the research), we theorized that cooking perceptions and practices would be a function of individuals' family backgrounds, as well as their local communities, neighborhoods and social environments.

## Methods

This study used qualitative methods to explore cooking perceptions and practices among adults. We conducted seven focus groups in two neighborhoods in Baltimore, MD between November, 2014 and January, 2015; participants were recruited from one neighborhood with higher median income and access to healthy food and another with

lower income and low access to healthy food. The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

***Site selection***

Two neighborhoods were purposively selected for participant recruitment and data collection based on differences in socio-economic status (SES) and food environment indicators. Neighborhoods were identified using data from the Maryland Food System Map [170] and Baltimore City Department of Public Health [171]. The two neighborhoods were selected to facilitate comparisons between individuals with high SES living in a neighborhood with high food access, and individuals with low SES living in a food desert neighborhood. **Appendix Table 1** describes demographic, socio-economic and food environment characteristics of the two neighborhoods and Baltimore City overall.

***Recruitment and selection of participants***

We used the Maryland Food System Map to identify all food stores and businesses in the two recruitment neighborhoods. Neighborhood specific fliers (identical except for different information about where the focus groups would be conducted) were posted at a random selection of those food outlets (with permission of the owner or manager). In addition, fliers were posted on bulletin boards at libraries, churches and apartment buildings in the neighborhoods. Fliers specified that we were conducting research about home cooking and that we were interested in the views of people who "love to cook, hate to cook, cook all the time or not at all".

Participants could respond to the flyer via telephone or email. The lead author responded to all inquiries, and participants who fit the inclusion criteria (over 18 years

old and living in the recruitment neighborhood (based on self-report) were accepted on a first come first served basis. In order to achieve a more diverse sample, before recruitment began for the final group in the higher income/food access neighborhood (hereafter called Neighborhood 1), the flyer was posted on social media website of a neighborhood group, and individuals who had previously inquired about the groups but who had been unable to attend were re-contacted. Participants accepted to this group met the additional inclusion criteria of identifying as non-Black and having at least some college education.

***Data collection***

Focus groups were held in meeting rooms at public libraries centrally located within the neighborhoods. Four focus groups took place in Neighborhood 1, three with all female participants and one mixed gender group. Three groups took place in Neighborhood 2, two with all females and one with all males. In Neighborhood 2 all participants were Black and, in Neighborhood 1, one focus group was comprised of all Black participants, one with all White participants, and two groups were comprised of White, Black and Asian participants. At the start of each group participants filled out a short demographic survey. In this survey, participants were asked to report how frequently they, or someone in their household cooked dinner during an average week. The focus groups lasted 90 minutes and were moderated by the lead author. A research assistant also took notes at all groups and all discussions were audio recorded. Participants were compensated for their time with a $40 CVS gift card and could only participate in one focus group.

A single discussion guide was developed by the research team. Questions were open-ended to encourage discussion among participants and to facilitate respondent-driven content through an inductive process. Topics or opinions raised in the initial groups were posed to later groups, such that the discussion guide evolved throughout data collection. This semi-structured approach provided some level of consistency in content across all groups while also allowing for flexibility to react to the dynamics and flow within each discussion and incorporate new findings into subsequent groups. To facilitate discussion about what activities or ingredients are considered cooking, we used pictures of fresh, frozen, and packaged products taken at a local grocery store and asked participants to consider whether using those products constitute cooking. **Table 4.1** shows key discussion questions from the final guide.

***Analysis***

Audio recordings from the focus groups were transcribed verbatim by a professional service. The lead author coded each transcript using a grounded theory approach [151]. Coding began without any codes defined *a priori* and followed an iterative and inductive process [151]. First, line-by-line initial codes were defined. Transcripts were revisited multiple times as new initial codes were identified. Then, initial codes were grouped into focused codes, and finally into broad themes or categories. The lead author also used reflective memos throughout data collection and detailed focused code memos during data analysis [151]. The qualitative data analysis software HyperRESEARCH 3.7.2 (ResearchWare, Randolph, MA) was used to facilitate coding, data management, and analysis.

## Results

Fifty-three individuals participated in seven focus groups – 36 participants in Neighborhood 1 (high income/food access) and 17 participants in Neighborhood 2 (low income/food access). Characteristics of the study participants are presented in **Table 4.2.** The mean age of the study participants was 51 years (50 years in Neighborhood 1 and 53 years in Neighborhood 2). Overall, participants were 66% Black, 31% White and 4% Asian, though in Neighborhood 2 all participants identified at Black. The majority of participants were female (74% overall, 81% in Neighborhood 1, 59% in Neighborhood 2). Participants in Neighborhood 1 also tended to be more highly educated than participants in Neighborhood 2 (69% of Neighborhood 1 participants had at least some college compared to 37% of Neighborhood 2 participants). On average, participants reported that they or someone in their households cooked dinner 4.3 days per week. In Neighborhood 1, 13% of participants reported cooking dinner infrequently (zero or one days) and 33% of participants cooked dinner frequently (six or seven days). In Neighborhood 2, 24% of participants reported cooking dinner zero or one day per week and 41% reported cooking dinner six or seven days per week (see **Appendix Table 2**).

Pooling responses across the seven focus groups, we identified three emergent themes: 1) perceptions of cooking, 2) cooking in the context of modern life, and 3) cooking strategies among frequent cooks. During analysis, comparisons were made across groups and individuals to identify any notable patterns by gender, age, race/ethnicity, or between the two neighborhoods. Because few differences between the neighborhoods or among participant demographic groups were noted, results are presented collectively, but where observed, differences by neighborhood or demographic characteristics are noted.

***Perceptions of cooking***

Perceptions of cooking varied considerably, regardless of neighborhood, and spanned a continuum from all scratch cooking to any food made at home. **Table 4.3** reports illustrative quotations demonstrating the spectrum of cooking perceptions. Perceptions incorporated considerations of the importance of scratch ingredients, the degree of time, effort and love involved if convenience foods were used, and whether or not food was heated in some way. For many, the application of heat was unimportant, and cooking was understood to encompass any food preparation. The importance of heat for a few participants was based on a literal definition of cooking meaning "to heat" but did not carry any sort of value judgment.

> *"It's not a judgment for me. It's not like, oh, it's better or worse because it's cooked or not cooked. It's just that for me, cooking does mean something was heated."* (Participant 3, Focus Group 7)

On the other hand, scratch cooking was perceived as preferable, or "*the best"* and there was consensus that if a person used scratch or fresh ingredients to make a meal, that person had cooked (though as noted above, for some participants heat would have to have been applied). However, while scratch or fresh ingredients were highly valued, as one participant put it, *"you don't have to go back to the 1800's. We don't have to churn our own butter and make our own noodles... Everything won't be totally from scratch."* (Participant 8, Focus Group 1) Opinions differed as to under what circumstances using prepackaged, boxed or otherwise processed products (convenience foods) should be considered cooking. Putting one's own twist on a product or recipe, investing time, or putting love or effort into a meal were important determining factors when deciding

whether a meal should be counted as cooking. However, even participants who thought convenience foods constituted cooking still attached a higher value to meals made from scratch ingredients.

Older participants and those who identified as a healthy eater/cook recognized convenience foods as an integral part of everyday food preparation, but generally did not consider using convenience foods to be cooking. For others, anything made in the home was considered cooking. These discussions often became quite lively and in some cases became heated disagreements about both whether convenience foods, as well as whether heating something in the microwave, considered by some participants to be a less skilled and traditional mode of preparing food, should be considered cooking.

Moderator: *"This is frozen macaroni and cheese. Is this homemade? Is it cooking?"*

Participant 10, Focus Group 1: *"That's not homemade."*

Participant 1, Focus Group 1: *"Wait a minute now!"*

Participant 8, Focus Group 1: *"It's packaged for sale. You make it at home."*

Participant 7, Focus Group 1: *"Its factory made."*

While most participants discussed microwaves in a positive light and described them as a helpful tool that facilitated their ability to eat home cooked meals (even if they didn't consider using them to re-heat leftovers to be cooking), a few individuals expressed negative perceptions of microwaves as either being less healthy (due to radiation or *"zapping"* nutrients out of the food) or as being a "*lazy"* or *"cheating"* way of cooking. Many older participants in particular dismissed microwaves (particularly when being

used to heat convenience foods rather than re-heat home cooked leftovers) as a sign of diminished cooking skills and interest among the younger generation.

> *"The young ones don't know how to cook. All they're going to do is go to the store and go to a restaurant or something like that. Don't even sit down and try to cook… coming up, we really cooked. Nowadays basically, the kids coming up now, mostly everything is microwaved. It's the fast thing nowadays."* (Participant 5, Focus Group 4)

Individuals who self-identified as a good cook and incorporated being a person who cooks and enjoys cooking into their identity articulated a difference between anything made at home and a homemade meal. For these individuals the amount of time, effort or skill used during preparation, in addition to the use of convenience foods, were important factors used to distinguish between whether a meal made at home should be considered homemade. In contrast, some participants emphasized that they were not cooks, did not know how to cook and did not enjoy cooking.

> *"My favorite food in the whole wide world is spaghetti, every day, every night. But again, I live by myself, and I can't cook. My idea of spaghetti is—this is real homemade. …I make Oodles of Noodles, I boil my hot dogs... I cut my hot dogs up in the Oodles of Noodles and my sauce is ketchup. That's homemade."* (Participant 3, Focus Group 4)

The other members of this man's group responded with validation that his description qualified as homemade meal, even if they wouldn't consider it homemade themselves. The participant then went on to clarify that even though this was his homemade, he didn't

consider it as good as "*real spaghetti*" and it wasn't *"real"* cooking because it wasn't made from scratch.

Regardless of neighborhood, the manner in which participants categorized different kinds of cooking was primarily a function of their values and feelings about food and cooking:

> *"I have different categories of my cooking. I have home cooking- that's scratch. Which means I use every ingredient and it's done by hand. Then I have semi-home cooking, where I may use a box meal, you know, like Betty Crocker something. And then add my own ingredients to that. That's semi-cooking. So that's quick meals…. But most of the time, it's between semi- and home cooking-scratch. And then every now and then, those quickie foods like Oodles of Noodles or something like that… Like things like frozen dinners, quickie foods, hot dogs, frozen hamburgers, all right? That's quickie."* (Participant 5, Focus Group 3)

Regardless of an individuals' personal standard when it comes to cooking, there was a general consensus that perceptions of cooking and whether something counts as cooking is a personal decision and there was not a single standard or definition that could or should be applied to everyone.

### *Cooking in the context of modern life*

Among participants from both neighborhoods there was a strong perception that cooking at home was less expensive than eating at restaurants, and participants cited cooking at home as a way to save money and to avoid unhealthy or unsanitary practices in restaurants.

> *"I think it's cheaper to cook at home versus going out all the time, you know? Because some of the restaurant food, you don't know what's in it. And it's not healthy, you know. So its cheaper to me, and more safe."* (Participant 1, Focus Group 3)

Though cooking at home was viewed as being more affordable than eating in restaurants, cooking healthfully at home was challenging for many participants. Being able to afford scratch or fresh ingredients, especially fresh fruits and vegetables, meat or fish was brought up as a challenge, particularly among participants in Neighborhood 2 (lower income/food access). The biggest challenges participants in Neighborhood 2 cited when it came to cooking at home was the price of food, the price of healthy food, insufficient benefits from programs such as Supplemental Nutrition Assistance Program (SNAP) or Social Security, or just the poor economy overall. As one participant put it, *"The economy makes it almost impossible to eat healthy seven days a week."* (Participant 6, Focus Group 1) Though people did talk about shopping at multiple stores to find the best deals, or to find retailers that accepted their SNAP benefits, participants did not cite lack of physical access to food as a challenge- affordability was by far foremost in their minds.

> *"I don't know about anyone else, for me, buying food is really hard for cooking. Okay, for one thing, I'll say they cut food stamps bad… So I really have to make all my dollars stretch, because I'm using cash now more than food stamps, right? And it's very limited. So I think the problem with a lot of people with cooking, it's not so much the cooking, it's getting the food to cook."* (Participant 5, Focus Group 3)

The need to balance time, cost and health became a dominant theme throughout the groups. Participants in both neighborhoods felt that one of these three always had to give, or if they had more time or if food was more affordable (either due to lowering prices or increasing income) they would be able to eat more healthfully than they do.

> "*And it goes back, to me, to like the balance of like the health, time and cost factor. So I've noticed like if you-- like we buy a lot in bulk, and get a lot of things that you do, like dried lentils and dried beans, and things like that... And when I looked at cost per serving when I looked at it, can be lower some of the like quick-fix kind of prepared foods, which you're kind of paying for convenience, but you have to have either the time or the resources up-front to buy those things in bulk, or the storage space for it, or the time to soak them, or whatever it takes. So it's like I said, a triple-balance that I'm always trying to achieve."* (Participant 2, Focus Group 5)

While participants from Neighborhood 2 (lower income/food access) discussed making tradeoffs between eating inexpensive and highly processed products versus fresh fruits and vegetables or, in some cases, not being able to afford food at all, individuals from Neighborhood 1 (higher SES/food access) were making tradeoffs of a different kind (deciding to purchase expensive items like red meat or organic produce) or weighing the long term health consequences of their diet choices. Regardless of neighborhood income, participants who identified as good cooks and healthy eaters seemed to take a great pride and satisfaction in cooking foods at home rather than paying more money for them elsewhere.

*"When I'm home I can take the same money that I'm going to give to this restaurant that I'm going to have to tip somebody to bring it to me, and I can stay home and fix my own stuffed clams, my own calamari, and then have enough to get a bottle of wine!...stay home and keep the tip for yourself!"* (Participant 3, Focus Group 6)

Having enough time to cook, or the need to balance busy lives and many time commitments with providing food for families was a recurring theme in all groups. People in both neighborhoods discussed the need to plan extensively or find ways to cook easy/fast meals due to busy schedules. In addition to relying on cooking with crockpots or using leftovers to mitigate time constraints, some participants talked about not being able to adopt healthy eating habits because their lives were too busy or they didn't have enough time. This was particularly true in the Neighborhood 2 groups.

*"I try to watch my pizza intake because I was eating like pizzas, whole pizzas all the time because by the time I get home from school, eat, done with the kids homework, it's really no time to even cook so I would just order, order, order."* (Participant 4, Focus Group 2)

Participants in both neighborhoods talked about struggling with lack of time but participants who made cooking meals at home a priority found ways to cook meals in spite of their time constraints.

*"For me it's time mostly. I try to be as efficient as possible and when it gets to Sunday or Saturday and I have some free hours there I try to cook something that will last me for part of the week and then pack it so every day I will take something out and cook it. I will spend two or three hours doing many things so*

*that I will have that. If I had the time every day to go and cook, I would try to do that, but that's the most efficient system."* (Participant 9, Focus Group 6)

In Neighborhood 1 (higher income/food access), cooking as a hobby, or cooking as a source of relaxation or enjoyment, and the joy of sharing home cooked food with others was a more prominent theme than in Neighborhood 2.

*"I can come home at eight o'clock and still cook for two hours even if I'm dog tired because I like it so much… I actually find it to be really energizing and I think also that it does make me happy... So even if it takes time after work I think I'm usually willing to give that time because I like it."* (Participant 2, Focus Group 6)

There was strong consensus that the high importance attributed to cooking (particularly scratch cooking) that emerged as the dominant view in each focus group was not typical of most participants' communities: *"It's not many people out there who do a lot of cooking, that make a lot of things from scratch any more. You very seldom find it."* (Participant 1, Focus Group 2) Focus group participants recognized that their cooking habits were not typical and expressed that they perceived a lack of cooking knowledge and/or interest in their community particularly among younger people.

*"When I talked about stuff that I'm cooking or I'm planning to cook, my coworkers they kind of look at me with these weird stares of like you are really going to spend that much time cooking that?... I probably spend four or five times more in preparing the foods that I eat than the rest of my coworkers do."* (Participant 7, Focus Group 6)

***Strategies among frequent cooks***

With a few exceptions, focus group participants cooked frequently and highly prioritized incorporating cooking into their lives. Wanting to eat healthfully (or healthier) and the desire to have control over the food one eats emerged as prominent themes. Though not universally the case, among participants in Neighborhood 1 (higher income/food access), cooking was seen as a way to create a healthier diet.

> *"I have to be in control of what I eat- put in my body. What you buy all made up is full of chemicals that are dangerous, so I try to avoid things with aluminum or all that stuff that you will find in the prepared food, or in the junk food."*
>
> (Participant 7, Focus Group 5)

In contrast, Neighborhood 2 (lower SES/food access) participants' conveyed an interest in changing their diets to be healthier in response to already existing diet-related health problems such as high blood pressure, diabetes and overweight or obesity.

> *"I like to eat salt all the time, but I can't eat it now…because I'm a diabetic. I can't eat a lot of cake and stuff that I like, and I got to change my way or eating, and it's kind of difficult for me… I'm not where I want to be, but I'm not like I used to be, eating crazy."* (Participant 1, Focus Group 4)

Several common strategies emerged that enabled participants to incorporate cooking into their lives. First, many participants used extensive planning and organizational skills to enable them to find time to cook and cook in the most efficient way possible. Meal planning on a weekly basis was a common theme, especially among employed participants with young children.

*"I am sort of rigorous in my process. I have a daughter and I work three days which is great. Monday is the day that the whole week gets planned out food wise so I'll normally do three or four things…. It's a lot of just sitting down and figuring out what we're going to eat."* (Participant 6, Focus Group 7)

Cooking meals in bulk and using leftovers were another prevalent theme. Participants in both neighborhoods who cooked frequently and were trying to eat healthfully spoke enthusiastically about how cooking large meals and freezing leftovers for later was a very helpful strategy. And, finding shortcuts and preparing or processing ingredients in advance (such as blanching vegetables or portioning proteins such as chicken) and freezing them for later use were other common strategies people used to help them cook affordably and efficiently. Participants from Neighborhood 2 described slow cookers or crockpots to be particularly helpful when cooking meals at home on a budget, and leading busy lives.

*"I find it easier when I cook a lot on Saturdays and put it in containers. That way I can use my microwave through the week when we rushing in or when we come home late…. I try to cook one day and then microwave everything during the week. If I can't do that, then I have to go to my slow cooker."* (Participant 4, Focus Group 2)

*"I have lived alone in the last 20 years or so but I got in the habit when I buy meat right out of the package I divide it into one-section portions and freeze it all except for the one portion I'm going to cook."* (Participant 4, Focus Group 7)

Participants utilizing these skills were highly motivated to cook and prioritized ensuring they were able to cook meals for themselves or their families. Not all participants were similarly motivated to cook or possessed the same level of organizational, planning and management skills. Those participants who did not cook frequently provided rationales based around not enjoying cooking, or not thinking they were good enough cooks, or, in some cases living alone and not wanting to cook for just one person.

> *"I'm not a cook. I come from a family of cooks, my sister, my mom and my dad. But me, I'm really not domestic…I just don't like it. I don't like to cook. I don't."* (Participant 11, Focus Group 1)

## Discussion

This is the first study to examine how people perceive cooking as well as the barriers and facilitators to incorporating cooking into their lives. The results indicate that there is no universal definition of cooking, even within a single neighborhood income or a shared level of food access. People perceive cooking quite differently based on whether heat, scratch ingredients or convenience foods are used. Convenience foods were widely used in the cooking process but there was broad agreement that scratch cooking was preferable. Commonly cited barriers to cooking included: lack of time and inability to afford scratch or fresh ingredients. Commonly cited facilitators to cooking included: organization, planning, and enjoyment of cooking.

Our finding that the meaning of cooking lacks a single definition is consistent with prior literature [5,102]. In fact, there was a general consensus in our sample that how one defines cooking is a personal decision and there was not a single standard that could

or should be applied to everyone. Similar to prior studies, study participants conceptualized cooking based on the degree of time taken or effort expended [5,6] and viewed scratch cooking as preferable to cooking with convenience foods (even among participants who frequently cooked with convenience foods and included them in their definition of cooking) [172]. Our findings challenge prior studies that concluded that among home cooks, convenience foods are as acceptable as scratch ingredients in the cooking process [5]. Our findings suggest that rather than defining a meals as cooked vs. not cooked, different categories of cooking that incorporate the use of convenience foods and span the continuum from all scratch cooking to fully prepared meals may be more useful. These categories could include, for example, scratch cooking (all or almost all scratch ingredients are used and time and energy are invested), semi-scratch cooking (convenience foods are used, but some scratch ingredients and/or personal touches are added, preparation is fast and less skill and planning is necessary), and quick meals (no scratch ingredients, mostly re-heating or de-frosting). It will be important for future research to examine the utility or applicability of this way of categorizing home cooking practices in other, broader populations.

Although we found few differences by neighborhood SES or food access in cooking perceptions or in the strategies people used to help them eat home cooked food, we did observe differences in the challenges people described facing when it comes to fitting cooking into their lives. People in the low income/food access neighborhood cited affordability of food (particularly fresh produce and other scratch ingredients) as a major barrier to cooking. In contrast, people in the high income/food access neighborhood also

cited affordability as a concern, but in the context of making tradeoffs between high cost items such as organic produce or hormone free red meat.

Interestingly, access to food was not mentioned as a barrier in these focus groups - even among participants living in a food desert neighborhood. Rather, affordability of food was overwhelmingly mentioned as their biggest concern. Participants felt that they had access to food, but could not afford it. This contrasts with a robust literature emphasizing disparities in access to healthy food between high and low income neighborhoods and the importance of the neighborhood food environment for food choices [15,62,109,139,173]. The Healthy Food Financing Initiative and the Healthy Corner Store Network are policy responses to this literature that have sought to increase the number of stores and improve the availability of healthy products in food desert neighborhoods [174,175]. Our results suggest that people are willing to seek out the food they want even if it is not readily available in their neighborhoods, but that increasing physical access to food without addressing high prices of fresh produce and other healthy and desirable products may have limited impact on shifting eating (and cooking) habits. Increasing SNAP benefits and expanding programs that increase SNAP participant's spending power (such as the Double Up Bucks program which matches SNAP spending at farmers markets)[176], in combination with increased access to fresh, healthy food, could help lower-income individuals both afford the food they want and decrease the time they spend procuring it.

Our findings suggest that the meaning of cooking is complex and not uniformly understood. This underscores the need for public health messages about healthy eating to account for heterogeneity in perspectives about cooking which may, in turn, encourage

more frequent cooking. For example, de-emphasizing scratch cooking may encourage cooking among those who report lack of confidence or negative attitudes towards cooking. Messages to reach this group might focus on incorporating healthy convenience foods (such as pre-cut and portioned vegetables, frozen vegetables and proteins, and ready-made sauces) into the preparation of healthy meals as it would be less time consuming [87]. Notably, a message focused on convenience might be considered "cheating" and not resonate among those who define cooking as the use of scratch ingredients. Our findings related to facilitators which encourage cooking (e.g., organizational and planning skills) suggest that cooking classes should emphasize these skills in addition to the food preparation process itself.

This study should be considered in light of several limitations. First, the research was conducted in an urban setting in Baltimore, MD, and the generalizability to other, particularly non-urban, settings is limited. Second, the participants self-selected into the study by responding to fliers posted in their neighborhoods. Although the fliers emphasized that we were interested in the views of people who both liked and did not like cooking, and people who cooked infrequently, the participants were composed of people who were interested in the topic and a majority liked to cook. The participants, themselves, observed that their cooking practices and attitudes were not representative of their social networks and broader communities. However, this was not universally the case, and we did observe a diversity of both cooking behavior and opinions about cooking among participants from both neighborhoods. In addition, the sample in Neighborhood 2 was substantially smaller than that of Neighborhood 1. This was due to a higher rate of confirmed participants not showing up for their scheduled focus group and

could have contributed to self-selection bias. Third, although we designed the study to recruit participants from two distinct neighborhoods, there was considerable heterogeneity among the participants in Neighborhood 1 (high income/food access). This may have been because Neighborhood 1 was a mixed income neighborhood, or because we placed the fliers in locations with high foot traffic and only confirmed neighborhood residence by self-report. Fourth, we did not attempt to collect data on cooking knowledge or skills, both of which may be related to cooking perceptions and practices. More research is needed to explore how knowledge is related to cooking perceptions and the strategies people use to overcome the barriers they face in preparing food. Finally, to build upon this formative study, additional research is needed in a larger sample to further refine and quantify how people perceive the meaning of cooking and how those perceptions are related to cooking behavior.

## Conclusion

This study described how Americans understand the meaning of cooking. Cooking is complex and not uniformly understood. Generally, perceptions of cooking are based on whether heat, scratch ingredients or convenience foods are used. Scratch cooking was highly valued and viewed as preferable, though convenience foods were widely used. Key barriers to cooking included lack of time and affordability. Key facilitators to cooking included organization and meal planning. More research is needed to explore differences in cooking perceptions in other, diverse populations and to develop effective interventions to reduce barriers to healthy cooking which are consistent with people's perceptions of cooking.

## Tables

**Table 4.1: Key focus group discussion questions.**

| |
|---|
| Food preparation practices<br>▪ What was the last meal you cooked? Why did you choose it? How did you make it?<br>▪ What influences the way you prepare meals?<br>▪ Describe any challenges you face when it comes to cooking.<br>▪ Some people promote eating more home cooked meals as a way to eat healthier. What do you think of this recommendation?<br>▪ Have/how have your cooking habits changed over time? |
| Perceptions of cooking<br>▪ How do you feel about cooking?<br>▪ What does home cooking mean to you?<br>▪ In surveys, people report cooking, on average, 6 or 7 nights a week. Based on your experience, what kinds of activities do you think they are talking about?<br>▪ What kinds of things do you consider when deciding if something was homemade?<br>▪ Is cooking important to you? Why or why not? |

**Table 4.2: Demographic characteristics of the study sample overall and by recruitment neighborhood.**

| | Total | Neighborhood 1 | Neighborhood 2 |
|---|---|---|---|
| Number of focus groups | 7 | 4 (FG 1 & 5-7) | 3 (FG 2-4) |
| Number of participants [n (%)] | 53 (100) | 36 (68) | 17 (32) |
| Mean age (SD) | 51 (14.8) | 50 (16.1) | 53 (12.1) |
| Age [n (%)] | | | |
| 18-44 | 15 (28.3) | 12 (33) | 3 (18) |
| 45-64 | 29 (55) | 17 (47) | 12 (71) |
| 65+ | 9 (17) | 9 (19) | 2 (12) |
| Sex [n (%)] | | | |
| Male | 14 (26) | 7 (19) | 7 (41) |
| Female | 39 (74) | 29 (81) | 10 (59) |
| Race [n (%)] | | | |
| Black | 35 (66) | 18 (50) | 17 (100) |
| White | 16 (31) | 16 (44) | 0 (0) |
| Asian | 2 (4) | 2 (6) | 0 (0) |
| Education [n (%)] | | | |
| Some high school | 2 (4) | 1 (3) | 1 (6) |
| High school | 19 (37) | 10 (28) | 9 (56) |
| Some college | 12 (23) | 7 (19) | 5 (31) |
| College graduate | 19 (37) | 18 (50) | 1 (6) |
| Employment [n (%)] | | | |
| Working part time | 8 (15) | 17 (6) | 2 (12) |
| Working full time | 12 (23) | 11 (31) | 1 (6) |
| Not working/retired | 32 (62) | 18 (51) | 14 (82) |
| Marital status [n (%)] | | | |
| Single | 26 (49) | 19 (50) | 8 (47) |
| Married | 8 (15) | 5 (14) | 3 (18) |
| Living with a partner | 10 (19) | 8 (22) | 2 (12) |
| Divorce, separated, widowed | 9 (17) | 5 (14) | 4 (24) |
| Has children [n (%)] | 32 (61) | 19 (53) | 13 (76) |
| Weight status* [n (%)] | | | |
| Underweight | 4 (8) | 3 (9) | 1 (6) |
| Healthy weight | 32 (62) | 22 (63) | 10 (59) |
| Overweight | 9 (17) | 4 (11) | 5 (29) |
| Overweight by >20 lbs | 7 (14) | 6 (17) | 1 (6) |
| Cooking frequency- days/week cooks dinner* [Mean (SD)] | 4.3 (2.0) | 4.4 (1.6) | 4.2 (2.7) |

*Self reported

Note: One participant in Neighborhood 1 declined to answer the question about frequency of cooking dinner.

**Table 4.3: Cooking perception considerations and illustrative quotes.**

| | |
|---|---|
| All scratch cooking<br><br>Anything made at home | *"What defines home cooking is that you put all of the ingredients in it and it's not pre-packaged, pre-prepared or persevered… It's fresh. And the other ingredient is the love, because its something about knowing somebody took two hours to make this from scratch."* (Participant 1, Focus Group 1)<br><br>*"Anything microwaved is not cooking, no matter what it is."* (Participant 4, Focus Group 4)<br>*"I think if you buy a can of pasta sauce and boil the noodles and put it together, I wouldn't call that home cooking… But I would call it home cooking if you made that pasta sauce from canned tomatoes with the spices… I think there is definitely a level of physical effort involved maybe to call it home cooking versus eating at home."* (Participant 6, Focus Group 7*)*<br><br>*"No, not cooking because it's already precooked and everything there is pre measured. It's nothing you have to do. It's no imagination. It's nothing"* (Participant 5, Focus Group 2, in reference to a box of macaroni and cheese).<br><br>*"When you go to the store, you buy a "Hungry Man," you didn't make that… Like you take the work, you do the preparation, and do the seasoning and do all of that, that's cooking at home… I think it's different to me, far as cooking it at home or putting the box in the microwave."* (Participant 5, Focus Group 5)<br>*"But there's a lot of ways—and the cornbread, I love cornbread, especially homemade cornbread. I'll use the box but I'm going to add* [my own] *touch with that box."* (Participant 10, Focus Group 1)<br><br>*"If I cook a bunch of things and freeze portions and come home, defrost it and eat it, to me that serves the function of 'I didn't pay to eat out today, I ate something that was healthy that I made myself.' I don't have an ego invested in 'oh, I did Top Chef tonight.' I'm just keeping to my budget and to my way of life which is to eat healthy foods every day."* (Participant 4, Focus Group 7)<br>*"On the stove, anything prepared hot, or baked, fried, that's cooking."* (Participant 2, Focus Group 3)<br>*"For me, cooking is anything you prepare, whichever way, hot, cold, steamed, whatever. Anytime you prepare food in any form for consumption, it's cooking."* (Participant 5, Focus Group 3)<br><br>*"A homemade meal is a meal made at home. It's simple as that."* (Participant 8, Focus Group 1) |

## Chapter 4 Appendix

**Ch. 4 Appendix Table 1: Demographic and socio-economic characteristics of Baltimore city and the two recruitment neighborhoods.**

| | Baltimore City | Neighborhood 1 | Neighborhood 2 |
|---|---|---|---|
| Age (%) | | | |
| 18-44 | 41.3 | 66.3 | 40.8 |
| 45-64 | 25.2 | 18.3 | 23.4 |
| 65+ | 11.8 | 8.3 | 10.8 |
| Sex (%) | | | |
| Male | 46.7 | 48.8 | 45.4 |
| Female | 53.3 | 51.2 | 54.6 |
| Race (%) | | | |
| Black | 63.6 | 35.9 | 81.4 |
| White | 29.7 | 47.6 | 12.6 |
| Asian | 2.4 | 11.8 | 3.2 |
| Education (%) | | | |
| Residents ≥25 years old with ≤ a high school degree | 52.6 | 31.0 | 65.1 |
| Residents ≥25 years old with ≥ a bachelors degree | 25 | 55.6 | 17.4 |
| Economic indicators | | | |
| Unemployment rate (%) | 11.1 | 5.3 | 16.1 |
| Median Household Income ($) | $37,395 | $34,968 | $19,519 |
| Family Poverty Rate (%) | 15.2 | 16.5 | 27.5 |
| Food Environment | | | |
| Fast food Density (no./10,000 residents) | 2.4 | 19.75 | 5.9 |
| Carryout Density (no./10,000 residents) | 12.7 | 55.5 | 28.5 |
| Corner Store Density (no./10,000 residents) | 9 | 14.9 | 9.2 |
| Supermarket Proximity (min. by car) | 3.7 | 2.5 | 4.5 |

Note: Data compiled from the Baltimore City Department of Public Health's Neighborhood Health Profiles (2011). For both Neighborhood 1 and Neighborhood 2, data from two contiguous neighborhoods were averaged because data collection took place at locations right on the boarder between the two and recruitment took place in both neighborhoods.

**Ch. 4 Appendix Table 2: Self-reported frequency of cooking dinner among focus group participants (N=52*).**

| | Mean (SD) | Percentage | | | |
|---|---|---|---|---|---|
| | | 0 - 1 days/week | 2 - 3.5 days/week | 4 - 5 days/week | 6 - 7 days/week |
| Overall (N=52) | 4.3 (2.0) | 13 | 21 | 33 | 33 |
| Neighborhood 1 (N=35) | 4.4 (1.6) | 9 | 23 | 40 | 29 |
| Neighborhood 2 (N=17) | 4.2 (2.7) | 24 | 18 | 18 | 41 |

***** One participant in Neighborhood 1 declined to answer the question about frequency of cooking dinner.

# CHAPTER 5. PUBLIC PERCEPTIONS OF COOKING AND THE IMPLICATIONS FOR COOKING BEHAVIOR IN THE UNITED STATES

(Manuscript 2)


## Abstract

**Objective:** Despite the importance of cooking in modern life, public perceptions about what it means to cook are unknown. We aimed to examine perceptions of cooking and their association with cooking confidence, attitudes and behavior in the United States (U.S.).

**Design:** We designed and fielded a nationally representative survey among U.S. adults (N=1,112) in April 2015. We used factor analysis to identify perceptions about cooking, and used multivariate ordered logit and poisson models to explore associations between those perceptions and cooking confidence, attitudes and behaviors.

**Setting:** Nationally representative web-based survey of U.S. adults.

**Subjects:** U.S. adults aged ≥18 years.

**Results:** Americans conceptualized cooking in three ways: the use of scratch ingredients, convenience foods, or not using heat. Respondents who perceived cooking as including convenience foods were less confident in their ability to cook from scratch (OR 0.52, $p<0.001$) and less likely to enjoy cooking (OR 0.68, $p=0.01$) than those who did not. Though individuals who perceived cooking as including only scratch ingredients reported cooking dinner (4.31 times/ week), and using packaged/boxed products (0.95 times/

week) the least frequently, few notable differences in the frequency of cooking meals were observed.

**Conclusions:** Cooking frequency is similar among U.S adults regardless of how they perceive cooking, but cooking confidence and enjoyment is lowest among Americans who perceive cooking as including the use of convenience foods. These insights should inform the development of more specific measures of cooking behavior as well as meaningful and targeted public health messages to encourage healthier cooking.

## Introduction

Despite the importance of cooking in modern life, little is known about behaviors and perceptions of cooking in the United States (U.S.); much less is known about this critical intermediate step than is known about either food access or consumption [9,10,12,17,81,96,125]. Available evidence suggests that adults in the U.S. spend less time cooking now than in the past [26,75]. Yet, Americans currently report living in households where dinner is cooked an average of 5 nights per week with over half cooking dinner 6-7 times per week [27,78] and almost half of all food dollars are spent on food consumed at home [94].

The literature also suggests that convenience foods ("any fully or partially prepared foods in which significant preparation time, culinary skills or energy inputs have been transferred from the home kitchen to the food processor and distributor" [86]) have become ubiquitous in the modern diet. On a typical day, 90% of U.S. adults purchase convenience foods for use at home (as opposed to food away from home) [91] which represents almost 20% of all food expenditures [92]. By comparison, spending on fruits and vegetables accounts less than 10% of total food spending [92].

Little is known about how U.S. adults understand what it means to cook, particularly whether convenience foods are considered to be part of the cooking process. Limited evidence suggests that people do interpret the meaning of cooking quite differently, often differentiating between "real" cooking and "everyday" cooking based on the occasion (e.g. Thanksgiving or a birthday compared to a weekday dinner), the products used or meals being prepared [5]. Research also suggests that cooking confidence and positive attitudes about cooking are important determinants of cooking behavior, perhaps even more so than specific cooking skills [5,61]. For example, individuals who report confidence about their cooking are more likely to enjoy cooking, cook a wider variety of food, and experiment with new foods [61].

Cooking is a complex concept that does not have a single agreed upon or 'correct' definition in the literature [5,61,114,172,177,178]. In fact, uncertainty about the public's understanding of the meaning of cooking is often cited as a limitation in studies examining the association between cooking skills and cooking behaviors such as home food preparation [26,27,43,112]. Greater frequency of cooking at home is associated with consumption of a healthier diet [78], particularly among higher income households [169], and cooking at home is promoted as an obesity prevention measure [31-33]. A better understanding of this relationship is critical to maximize food preparation at home in order to promote the public's health.

The primary objective of this study is to describe the way in which adults in the U.S. conceptualize the meaning of cooking. We also examine associations between cooking perceptions and cooking confidence, attitudes and behavior. To our knowledge

this is the first study to examine cooking perceptions and the meaning of cooking in an American population using a nationally representative sample.

## Methods

We designed a web-based survey to measure cooking perceptions, confidence, attitudes and behaviors. We conducted seven focus groups with community members from diverse backgrounds to inform the design of the survey instrument. Where possible, previously validated items were used [179,180] and face validity of original items was assessed by multiple content area experts. The survey was reviewed by content experts and pilot tested before entering the field.

We fielded the survey in April 2015 using the survey research firm GfK's KnowledgePanel [160]. This GfK panel is commonly used for survey research to generate nationally representative estimates of attitudes and behaviors for numerous public health topics [161,163,164,181]. The study sample was drawn from GfK's approximately 50,000 panel members who are recruited through equal probability, address-based sampling from a sampling frame covering 97% of U.S. households (including households with unlisted telephone numbers, or without landlines) [160]. Households without internet access are given a computer and an internet connection from GfK [160]. GfK provides study-specific sample weights to correct for biases in sampling or non-response and to ensure the final sample is nationally representative (based on comparisons to the Current Population Survey). Our survey was fielded among 1,568 GfK Panel members (aged ≥18 years), of whom 1,137 completed the 53 item survey. The median survey completion time was 16 minutes. Twenty-four individuals who completed the survey in <4 minutes were excluded; resulting in a final sample size of 1,112 and a survey completion rate of 73%.

Weighted and unweighted characteristics of the study sample compared to national rates are available in **Appendix Table 1.**

### *Measures*

#### *Perceptions of cooking*

We asked respondents to respond to 18 statements to measure their perceptions of cooking. The development of the 18 statements was strongly informed by focus group data which suggested that method of preparation (both in terms of the equipment used and whether or not heat was involved), the degree of effort, and the types of ingredients used (scratch/fresh, or convenience foods) were of primary importance when people make determinations about whether something counted as being cooked. We did not assume any single "correct" definition of cooking when crafting the cooking perception measures, rather, we tried to word each question as neutrally as possible. The focus group data also informed the specific terms and products used in these measures to ensure that they would be accessible and easily understood by the general public. Each statement started with the same introduction: "There are many ways to prepare meals. Below are some examples of different ways people prepare meals. Indicate how strongly you agree or disagree that the following activities are cooking. There are no right or wrong answers." Then, respondents read the phrase, "I would say I have cooked if I…." followed by descriptions of different combinations food preparation activities and ingredients or products. For example, respondents were if they would say they had cooked if they "used boiling water to make pasta or noodles with sauce from a jar," if they "chopped vegetables to make a salad and used a store-bought salad dressing" or if they "made something in the microwave using mostly scratch or fresh ingredients." The full list of

statements can be found in **Appendix Table 2**. Responses were measured on a 7-point Likert scale from "strongly disagree" to "strongly agree". The order in which participants viewed the statements was randomized.

We used factor analysis to identify thematic areas (or factors) related to perceptions of cooking. We averaged the responses to the questions that loaded onto each factor and created dichotomous indicators of agreement (i.e., the factor was considered cooking) if the mean response of the items loading onto the factor was ≥5 (corresponding to three response categories: somewhat agree, agree, or strongly agree). We also measured cooking perceptions by combining the factors into one categorical variable with mutually exclusive categories.

*Cooking confidence and attitudes*

Cooking confidence was measured on a 7-point scale from "not at all confident" to "extremely confident". Participants were asked how confident they were that they could cook from scratch using fresh ingredients, follow a recipe, and cook a healthy meal. Respondents were asked about both positive and negative attitudes about cooking. To assess positive attitudes, respondents were asked how strongly they agreed or disagreed that they enjoy cooking, cooking helps them eat healthfully, they are a good cook, cooking is important to them, and cooking makes them happy. To assess negative attitudes, respondents were asked whether they feel that cooking takes too much time, costs too much, is a burden or chore, or is stressful. All responses were measured on a 7-point scale from "strongly disagree" to "strongly agree". Question order for both confidence and attitude measures was randomized.

*Cooking behavior*

To understand cooking behavior, we measured the number of times per week the respondent or someone in their household reported cooking breakfast, lunch and dinner as well as the frequency of cooking meals using scratch/fresh ingredients (such as fresh vegetables or raw meats), packaged/boxed ingredients (such as products that include flavor packets and dried pasta or rice but that require additional ingredients (such as butter or milk) and need to be heated), frozen products (such as frozen vegetables, fish or meat), and recipes. We also measured the frequency of consuming home cooked leftovers for breakfast, lunch and dinner. Responses ranged from 0 to ≥7.

*Demographic and socio-economic covariates*

Covariates included sex, age (18-29, 30-44, 45-59, 60+), race/ethnicity (White, Black, Hispanic, Other), education (less than high school, high school diploma, some college, college degree or more), employment status (working vs. not working), and marital status (married vs. not married). We also controlled for participation in U.S. government administered nutrition assistance programs such as the Supplemental Nutrition Assistance Program (SNAP) or Women's Infant's and Children's (WIC) based on whether the respondent or someone in their household was receiving SNAP or WIC benefits at the time of the survey. All responses were based on self-report.

***Analysis***

First, we performed a principal components analysis followed by exploratory factor analysis using an oblique rotation and polychoric correlation matrix on the 18-item set of cooking perception statements. We extracted 3 factors, described below. A scree plot and parallel analysis confirmed the extraction of 3 factors. Four items were dropped

because they had low factor loadings (<0.5) or high uniqueness (>0.5). Final factor analysis results for the 14 retained items are available in **Appendix Table 3**.

Next, we examined the percent of respondents who responded negatively (strongly disagree, disagree or somewhat disagree), no opinion, or positively (strongly agree, agree, or somewhat agree) to each of the 14 remaining cooking perception measures. Then, we used ordered logit multivariate models (and poisson models for cooking behavior outcomes) to estimate the association between cooking perception factor indicators and cooking confidence, attitudes and behaviors adjusted for the covariates described above. The cooking perception factors indicators were included in the same model to isolate the association between each factor and the outcomes while accounting for correlation between the factors (i.e., whether the respondent also considered other factors be cooking). Finally, we used poisson models to estimate the association between the mutually exclusive cooking perception categories and cooking behaviors. We used post estimation margins to estimate predicted mean cooking practices and behaviors for individuals in each of these cooking perception categories. For all analyses socio-demographic covariates were included based on prior literature [27,78,102] regardless of statistical significance. All analyses were conducted with Stata, version 13 (Stata-Corp LP, College Station, TX) and used GfK provided survey weights to produce nationally representative estimates. Significance was assessed at $p<0.05$.

## Results

The characteristics of the study sample are presented in **Table 5.1**, overall and by cooking perception factors. The study sample mirrors the socio-demographic characteristics of the United States (see **Appendix Table 1**). The factor analysis yielded 3 cooking perception factors measuring agreement that cooking involves using: 1)

convenience foods (i.e. canned tomato sauce or soup, frozen meals, boxed macaroni and cheese), 2) scratch ingredients (i.e. fresh vegetables, home made salad dressing, or raw instead of frozen/pre-cooked meat) 3) cold preparations not using heat (i.e. salads or cold sandwiches). Of the 1,112 respondents, 352 included convenience foods in their definition of cooking, 921 agreed using scratch/ fresh ingredients counted as cooking, and 506 included not using heat in their definition of cooking. There were no significant differences in socio-demographic characteristics between those who considered convenience foods to be cooking and the full sample, whereas those who considered not using heat to be cooking were more likely to be highly educated, not receiving SNAP or WIC, and obese.

***Perceptions of cooking***

**Figure 5.1** shows the unadjusted distribution of responses for the 14 cooking perception statements. Six items loaded onto factor 1, four items each loaded onto factors 2 and 3. Among the six items measuring agreement with the idea that convenience foods counted as cooking, agreement ranged from 72% agreement that using boiling water to make pasta with sauce from a jar is cooking to 31% agreement that using the microwave to defrost frozen meals is cooking. Agreement about whether heating store-bought frozen or packaged items constituted cooking was related to the method of heat (49% agreement for using the oven and 39% agreement for using the microwave).

There was overwhelming agreement (77% to 86%) that using scratch ingredients, even in combination with other non-fresh ingredients was considered cooking. Only 7% to 10% of respondents stated they did not consider these activities to be cooking. Agreement with the two statements about making a salad was highest for chopping fresh

vegetables and making one's own salad dressing (67% agreement, 21% disagreement) and lowest for making a salad with already cut, washed, bagged or canned ingredients and using a store-bought dressing (43% agreement, 39% disagreement).

***Cooking confidence and attitudes***

**Table 5.2** reports associations between the 3 cooking perception factors and cooking confidence, attitudes and behaviors. Respondents who considered using convenience foods to be cooking were less likely to be confident in their ability to cook from scratch (OR 0.52, $p<0.001$), follow a recipe (OR 0.72, $p=0.03$), and cook a healthy meal (OR 0.67, $p=0.01$) compared to those who did not consider convenience foods to be cooking. They were also less likely to enjoy cooking (OR 0.68, $p=0.006$), think that cooking helps them to eat healthfully (OR 0.74, $p=0.02$), think that they are a good cook (OR 0.71, $p=0.01$), feel that cooking is important to them (OR 0.71, $p=0.02$), or that cooking makes them happy (OR 0.75, $p=0.04$) and were more likely to feel that cooking is burden or chore (OR 1.33, $p=0.04$) and that cooking is stressful (OR 1.41, $p=0.02$).

Respondents who considered scratch ingredients or not using heat to be cooking were more likely to be confident in their ability to cook from scratch (scratch ingredients: OR 4.27, $p<0.001$; no heat: OR 1.79, $p<0.001$), follow a recipe (scratch ingredients: OR 7.01, $p<0.001$; no heat: OR 1.45, $p=0.01$) and cook a healthy meal (scratch ingredients: OR 3.74, $p<0.001$; no heat: OR 1.75, $p<0.001$) compared to those who did not.

Respondents who considered using scratch ingredients or not using heat to be cooking were more likely to have positive attitudes about cooking than those who did not consider each of those activities to be cooking. Specifically, they were more likely to enjoy cooking (scratch ingredients: OR 2.91, $p<0.001$; no heat: OR 1.47, $p=0.003$), feel

that cooking helps them eat healthier (scratch ingredients: OR 4.44, p<0.001; no heat: OR 1.56, p<0.001), feel they are a good cook (scratch ingredients: OR 3.48, p<0.001; no heat: OR 1.67, p<0.001), cooking is important to them (scratch ingredients: OR 2.82, p<0.001; no heat: OR 1.72, p<0.001) and that cooking makes them happy (scratch ingredients: OR 3.15, p<0.001; no heat (OR 1.49, p=0.002).

***Cooking Behavior***

Perceptions of cooking were also associated with some differences in cooking behavior. Responses that included use of convenience foods as cooking were associated with less use of scratch ingredients (coef. -0.23, p<0.001) and greater likelihood of using packaged/boxed ingredients (coef. 0.43, p<0.001) compared to those who did not think using convenience foods was cooking. The perception that cooking does not imply the use of heat was associated with greater frequency of using scratch ingredients (coef. 0.15, p=0.005), packaged/boxed ingredients (coef. 0.18, p=0.05), and with greater frequency of cooking dinner (coef. 0.10, p=0.002).

**Table 5.3** shows predicted cooking behaviors overall and for each mutually exclusive cooking perception category. People who had the most inclusive definition of cooking (including all three cooking factors) reported cooking more frequently with packaged/boxed products (1.80 times/week vs. 0.95 times/week, p<0.001) and frozen products (2.56 times/week vs. 1.99 times/week, p<0.001) than people who perceived cooking to mean scratch ingredients only. Those who perceived cooking to include using only scratch ingredients reported cooking dinner the least frequently compared to those who defined cooking as meaning scratch ingredients and convenience foods or no heat (4.31 times/week vs. 4.81 times/week, p<0.001) and those who defined cooking broadly

to mean scratch ingredients, convenience food and no heat (4.31 times/week vs. 4.72 times/week, p=0.03).

## Discussion

In this study we explored cooking perceptions, confidence, attitudes and behavior among a nationally representative sample of U.S. adults and found that Americans perceive cooking in three main ways: use of convenience foods, scratch ingredients, and not using heat. Notably, while most (83%) respondents agree that using scratch ingredients is cooking, far fewer (32%) agree that cooking means *only* using scratch ingredients. People who include convenience foods in their definition of cooking are less likely to feel confident in their cooking abilities and less likely to have positive attitudes about cooking. Our results related to cooking perceptions and cooking behavior are more nuanced. While agreement that using convenience foods is cooking is associated with lower confidence and negative attitudes about cooking, those with more expansive definitions of cooking (including convenience foods and/or not using heat) report cooking breakfast, lunch and dinner more frequently than those who perceive cooking to be only scratch ingredients.

Lang and Caraher describe a culinary transition in which the skills needed to procure and prepare food are different now than in the past [103]. Results from the present study indicate that a similar transition may have taken place with regard to how the public conceptualizes the meaning of cooking. As technology has evolved (i.e. the invention of microwaves and other kitchen gadgets as well as advances in food science) and the food supply has expanded to include an ever growing number of convenience products, for many people in the U.S., perceptions of cooking have moved beyond

traditional home-made preparation with all scratch ingredients to include use of ready-made products and quick preparations.

Our findings related to cooking perceptions are consistent with prior qualitative work on public perceptions of the meaning of cooking which found that perceptions of what it means to cook span the continuum from preparation of raw foods only to anything involved in the task of food preparation [5,182]. Similar to the results from this study, perceptions of cooking were primarily based on whether scratch or fresh ingredients were used, the degree of effort or creativity invested if convenience foods were used, and whether or not heat was used [5,182].

Our findings related to cooking frequency are similar to estimates from the National Health and Nutrition Examination Survey (NHANES) (5.0 days/week) [27]. However, this general measure of cooking frequency in the NHANES masks important differences in more specific cooking practices; these results indicate that the frequency of using packaged/boxed, or frozen products is higher than using scratch/fresh ingredients. The manner in which people answer the question of how frequently they cook is related to how they conceptualize the meaning of cooking. To some extent this is expected; if one defines cooking as including all food preparation regardless of the ingredients or whether heat is involved, one would report cooking more frequently than a person who defines cooking more narrowly as including only scratch ingredients. This suggests that general measures of frequency of cooking may simplify the diversity of cooking practices and may have limited usefulness in what they reveal about the specifics of what a person is actually cooking or eating if they do not define or specify the kind of cooking being measured. This is a particularly important consideration for the design of epidemiological

surveys and evaluation instruments for the growing number of cooking class programs implemented in schools, federal nutrition assistance programs and other community programs [32,36,38,123,145,183,184].

In conceptualizing cooking, for some, the type of food being prepared is of primary importance (i.e. whether the food is fresh or processed/packaged), and for others, the method of preparation is of primary consideration (i.e. whether or not food is heated and if so, whether the stove, oven or microwave is used). In both cases, people seem to distinguish between a traditional or literal interpretation of cooking, and a more flexible or inclusive definition. However, even people who take the more traditional view of what counts as cooking use convenience foods, other 'short cuts', and cold food preparation in their everyday lives, but may not consider those 'every day meals' to be cooking [5,182]. These differences in cooking perceptions and behavior have important implications for public health messages promoting cooking for a healthy diet [78] in schools, and for programs such as SNAP [123,184,185]. Promoting home cooking as a healthy practice may not inspire changes in behavior if people already perceive that they are cooking frequently. Messages that focus on scratch ingredients only may not seem achievable to a wide audience. Especially for those who dislike cooking or lack confidence in their ability to cook, messages promoting more frequent cooking may not resonate. Among this group, messages about cooking and/or cooking classes might instead emphasize cooking with convenience foods that support a healthy diet (e.g., pre-cut and portioned vegetables, par-cooked rice or pastas, and pre-portioned meals with fresh ingredients and ready-made sauces) as well as building confidence and enjoyment in the process of preparing this food. Making these products more affordable and available in underserved

neighborhoods could facilitate consumption of a healthier diet without requiring people to dramatically change their food preparation practices.

More research is needed to explore broader attitudes and perspectives among people who perceive cooking in different ways. Specifically, it will be important to further explore distinctions people make about what counts as cooking and why, especially among those who include using convenience foods in their definition of cooking. Insights in this area will be important for the development of interventions to build cooking confidence and mitigate feelings that cooking is burdensome and/or stressful. More tailored interventions could be more effective at helping people cook (however they define the term) more healthfully and frequently. Research on how food policy and nutrition experts perceive the meaning and importance of cooking is also needed. Messages about cooking (often defined as scratch/fresh ingredients) being critical for both human and environmental health are common [186]. However, other resources (such as the cookbook for SNAP participants [124]) reflect a more flexible and inclusive view of cooking. More research is also needed to examine demographic trends and patterns in cooking perceptions and how people learn to cook. In addition, cooking knowledge and skills as well as differing experiences with learning how to cook may be related to how people perceive what it means to cook. Further research is needed to understand these relationships as well as how cooking perceptions and behavior are related to dietary intake and health outcomes.

This study has several limitations. First, our data are cross-sectional and do not allow for causal inferences about the relationship between cooking perceptions, confidence, attitudes or behavior. Second, web-based surveys have been criticized for

incomplete coverage or selection [187]. This concern is mitigated somewhat by GfK's recruiting strategy and by the fact that they provide computers and Internet access to those without it. Third, selection bias is a concern because 13.9% of those invited to be part of GfK's survey panel did so, and of those panel members who were asked to complete our survey, only 73% did so. However, the comparison of our sample to national rates alleviates some of this concern. Fourth, this survey did not assess cooking skills or knowledge which could be important for understanding cooking perceptions, confidence and behavior. In addition, our cooking perception measures did not comprehensively capture the full spectrum of all possible foods and preparations that could be important for some people's definitions of cooking. For example, we did not cover specific techniques such as poaching, roasting or steaming nor did we ask about specific recipes or adaptations to packaged products. Fifth, we intentionally combined healthy (e.g. frozen vegetables) and unhealthy (e.g. frozen French fries and chicken nuggets) ingredients in some measures so that the focus would be on the mode of preparation rather than the healthfulness of the items. However, if, for some respondents, healthfulness is an important consideration of whether something was 'cooked' this could have biased responses to these measures. Finally, these results were all self reported and the behavioral data are potentially subject to self-reporting and social-desirability bias.

## Conclusion

In conclusion, people perceive the meaning of cooking in three primary ways – the use of convenience foods, scratch ingredients and not using heat – which are related to their cooking confidence, attitudes and behavior. Public health messages which aim to promote healthy cooking should consider these diverse perspectives about cooking to

enhance effectiveness and reach. In a modern society in which time is scarce and convenience is a priority, a focus on scratch cooking only may be misplaced. Rather, promoting healthy cooking while incorporating convenience foods and quick preparations may be a more promising approach. More research is needed to develop more specific and accurate measures to understand cooking behavior. A greater understanding in these areas will be important for improving diet quality and decreasing the burden of diet-related diseases in the United States.

## Tables and figures

### Table 5.1: Demographic characteristics of the study sample by factors important for considerations of what counts as cooking, Home Cooking Survey, 2015 (N=1,112).

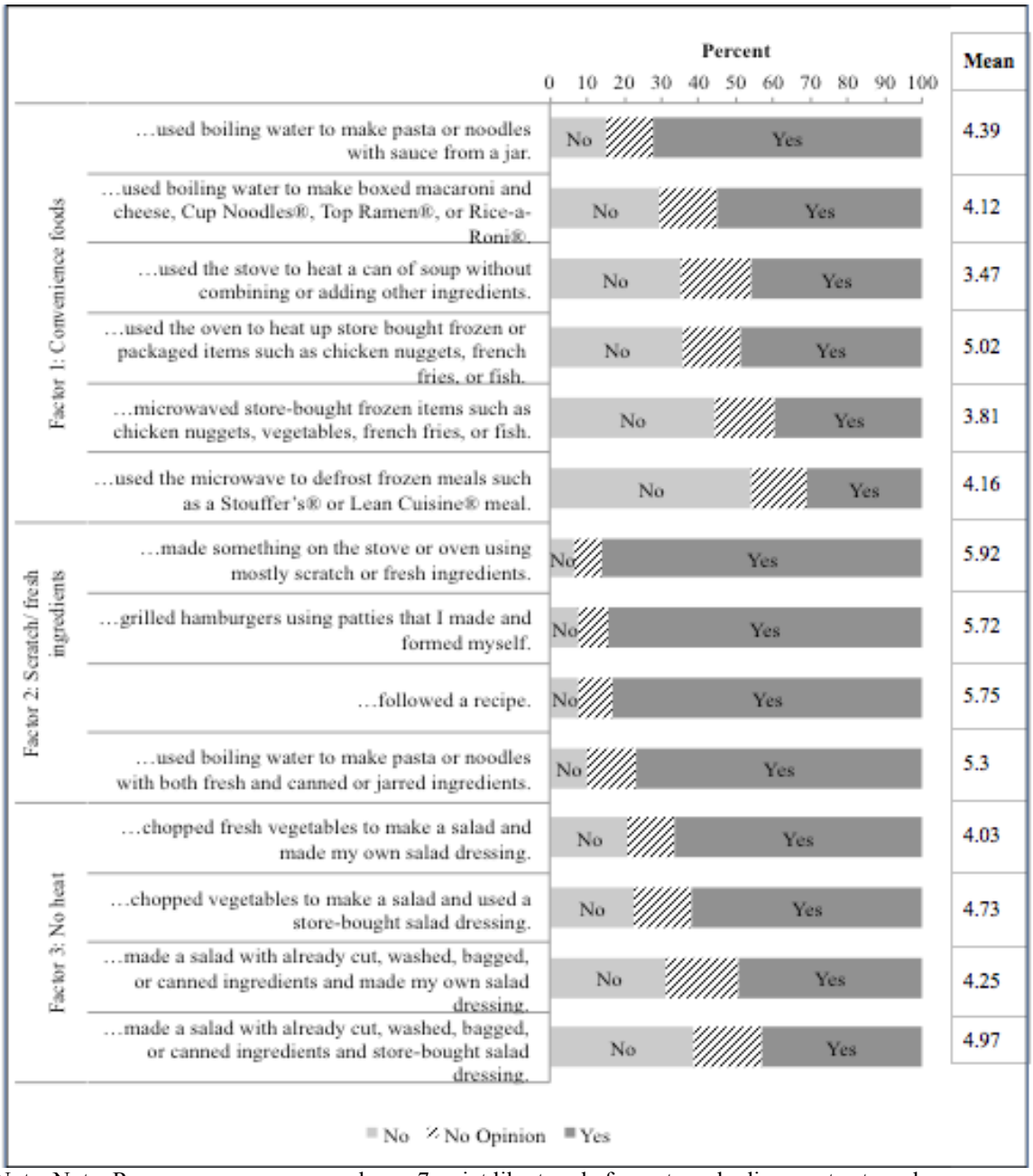
| | | Factor 1: Convenience foods | | Factor 2: Scratch ingredients | | Factor 3: No heat | |
|---|---|---|---|---|---|---|---|
| | TOTAL | N (%) | *p* for diff.[a] | N (%) | *p* for diff.[a] | N (%) | *p* for diff.[a] |
| TOTAL (*n* [%]) | 1,112 (100) | 352 (100) | | 921 (100) | | 506 (100) | |
| Female (*n* [%]) | 567 (52) | 180 (53) | 0.50 | 491 (55) | <0.001 | 272 (55) | 0.07 |
| Age (*n* [%]) | | | | | | | |
| Age 18–29 | 190 (21) | 59 (21) | 0.64 | 155 (21) | 0.11 | 83 (21) | 0.88 |
| Age 30–44 | 247 (25) | 70 (23) | | 194 (24) | | 111 (25) | |
| Age 45–59 | 333 (27) | 115 (29) | | 287 (28) | | 157 (28) | |
| Age 60+ | 342 (26) | 108 (27) | | 285 (27) | | 155 (28) | |
| Race (*n* [%]) | | | | | | | |
| Non-Hispanic White | 792 (66) | 247 (65) | 0.33 | 683 (69) | <0.001 | 367 (67) | 0.28 |
| Non-Hispanic Black | 106 (12) | 41 (14) | | 74 (10) | | 48 (12) | |
| Hispanic | 127 (15) | 35 (13) | | 98 (14) | | 51 (13) | |
| Other | 87 (8) | 29 (9) | | 66 (7) | | 40 (9) | |
| Education (*n* [%]) | | | | | | | |
| <High school diploma | 97 (12) | 32 (13) | 0.71 | 71 (11) | <0.001 | 37 (10) | <0.001 |
| High school diploma | 319 (30) | 100 (29) | | 244 (27) | | 125 (26) | |
| Some college | 319 (29) | 107 (31) | | 267 (29) | | 137 (28) | |
| Bachelor's degree or higher | 377 (29) | 113 (28) | | 339 (33) | | 207 (36) | |
| Household income (*n* [%]) | | | | | | | |
| Under $40,000 | 325 (32) | 107 (32) | 0.95 | 243 (28) | <0.001 | 137 (29) | 0.08 |
| $40,000+ | 787 (68) | 245 (68) | | 678 (72) | | 369 (71) | |
| SNAP and WIC status (*n* [%]) | | | | | | | |
| Received SNAP or WIC | 137 (15) | 39 (13) | 0.35 | 97 (13) | <0.001 | 48 (11) | 0.01 |
| Did not receive SNAP or WIC | 969 (85) | 311 (87) | | 821 (87) | | 456 (89) | |
| Employment status [*n* [%]) | | | | | | | |
| Working | 642 (57) | 204 (58) | 0.83 | 545 (59) | 0.02 | 297 (59) | 0.38 |
| Not working | 470 (43) | 148 (42) | | 376 (41) | | 209 (41) | |
| Marital status (*n* [%]) | | | | | | | |
| Married | 710 (61) | 222 (61) | 0.87 | 608 (63) | 0.004 | 335 (64) | 0.07 |
| Not married | 402 (39) | 130 (39) | | 313 (37) | | 171 (36) | |
| Primary grocery shopper (*n* [%]) | 589 (52) | 192 (54) | 0.37 | 506 (55) | 0.001 | 292 (58) | 0.003 |
| Body Mass Index[b] | | | | | | | |
| Normal | 331 (32) | 95 (29) | 0.09 | 276 (32) | 0.78 | 147 (31) | 0.002 |
| Overweight | 364 (35) | 108 (32) | | 299 (34) | | 142 (29) | |
| Obese | 352 (34) | 127 (39) | | 293 (34) | | 183 (39) | |

Notes: Factor categories were generated using polychoric factor analysis using promax rotation. Factors were dichotomized with scores ≥5 defined as that factor being important, and < 5 not important.

[a] Difference based on chi-squared test.

[b] Healthy weight [BMI (kg/m$^2$) 18.5-24.99], Overweight (BMI 25-29.99), Obese (BMI ≥ 30)

**Figure 5.1: Unadjusted overall perceptions of what food preparation activities are considered cooking, Home Cooking Survey, 2015 (N=1,112).**




Note: Note: Responses were measured on a 7-point likert scale from strongly disagree to strongly agree. "No" measures the sum of strongly disagree, disagree, and somewhat disagree, "yes" measures the sum of strongly agree, agree, and somewhat agree. "No opinion" reflects the middle value (4) of the 7-point scale (labeled "neither agree nor disagree). Cup Noodles® and Top Ramen® are dried noodles and a flavor packet that is prepared by adding boiling water. Rice-a-Roni® is a box of instant rice with a seasoning packet that is prepared with boiling water and butter. Stouffer's® and Lean Cuisine® are both brands with a variety frozen dinner products.

**Table 5.2: Adjusted associations between cooking perception factors[a] and cooking confidence and attitudes, Home Cooking Survey, 2015 (N=1,112).**

| | Factor 1 Convenience foods | | Factor 2 Scratch ingredients | | Factor 3 No heat | |
|---|---|---|---|---|---|---|
| | OR | (SE) | OR | (SE) | OR | (SE) |
| Confidence in ability to: | | | | | | |
| Cook from scratch | 0.52*** | (0.07) | 4.27*** | (0.75) | 1.79*** | (0.23) |
| Follow a recipe | 0.72* | (0.11) | 7.01*** | (1.32) | 1.45** | (0.20) |
| Cook a healthy meal | 0.67** | (0.10) | 3.74*** | (0.63) | 1.75*** | (0.24) |
| Attitudes towards cooking: | | | | | | |
| Enjoys cooking | 0.68** | (0.10) | 2.91*** | (0.43) | 1.47** | (0.19) |
| Cooking takes too much time | 1.25 | (0.18) | 0.82 | (0.12) | 1.15 | (0.15) |
| Cooking costs too much | 1.27 | (0.17) | 0.68** | (0.10) | 1.02 | (0.13) |
| Cooking helps to eat healthfully | 0.74* | (0.10) | 4.44*** | (0.78) | 1.56*** | (0.19) |
| I am a good cook | 0.71* | (0.10) | 3.48*** | (0.55) | 1.67*** | (0.21) |
| Cooking is important to me | 0.71* | (0.10) | 2.82*** | (0.41) | 1.72*** | (0.22) |
| Cooking is a burden or chore | 1.33* | (0.19) | 0.71* | (0.10) | 1.06 | (0.14) |
| Cooking is stressful | 1.41* | (0.20) | 0.67** | (0.10) | 1.04 | (0.14) |
| Cooking makes me happy | 0.75* | (0.11) | 3.15*** | (0.49) | 1.49** | (0.19) |
| | Coef. | (SE) | Coef. | (SE) | Coef. | (SE) |
| Cooking behavior (times/ week): | | | | | | |
| Cooking practices[a] | | | | | | |
| Use scratch/fresh ingredients[c] | -0.23*** | (0.06) | 0.30*** | (0.09) | 0.15** | (0.05) |
| Use packaged/boxed products[d] | 0.43*** | (0.09) | -0.32** | (0.11) | 0.18* | (0.09) |
| Use frozen products[e] | 0.10 | (0.06) | -0.02 | (0.08) | 0.18** | (0.06) |
| Used a recipe | 0.01 | (0.09) | 0.02 | (0.11) | 0.16* | (0.08) |
| Cooking frequency[b] | | | | | | |
| Breakfast | 0.11 | (0.06) | 0.09 | (0.08) | 0.13* | (0.06) |
| Lunch | 0.17** | (0.06) | 0.06 | (0.08) | 0.22*** | (0.06) |
| Dinner | 0.01 | (0.03) | 0.15** | (0.05) | 0.10** | (0.03) |

Note: Models are adjusted for cooking perception factors, gender, age, race/ethnicity, education, SNAP/ WIC status, employment status, and marital status. Survey weights are used to generate nationally representative estimates. Confidence was measured on a 7-point likert scale from "not at all confident" to "extremely confident". Attitudes were measured on a 7-point Likert scale from "strongly disagree" to "strongly agree". Ordered logit models were used for confidence and attitude outcomes. Cooking behavior was measured as number of times per week from "0 times" to "7 times or more". Poisson models were used for cooking behavior outcomes.

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

[a] Cooking perception factors were derived from 14 cooking perception statements, which began "I would say I have cooked, if I…[X]". Responses were measured on a 7-point likert scale from "strongly disagree" to "strongly agree". Factors were dichotomized with scores ≥5 defined as that factor being important, and < 5 not important.

[b] Cooking and eating frequency of meals ranged from 0-7+ days per week.

[c] Such as fresh vegetables, or raw meats.

[d] Such as boxed macaroni and cheese, Hamburger Helper, or Rice-a-Roni

[e] Such as frozen vegetables, fish or meats.

**Table 5.3: Predicted mean cooking behaviors overall and by cooking perception categories, Home Cooking Survey, 2015 (N=1,112).**

| | I would say I have cooked if I used… | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | TOTAL | | Scratch ingredients ONLY | | Scratch ingredients & convenience foods OR no heat | | ALL 3: scratch ingredients, convenience foods & no heat | |
| | n= 1,112 | | n= 357 | | n= 322 | | n= 242 | |
| | Mean | (SEM) | Mean | (SEM) | Mean | (SEM) | Mean | (SEM) |
| Cooking Practices[b] (times/week) | | | | | | | | |
| Use scratch/fresh ingredients[c] | 2.88 | 0.07 | 3.00 | 0.12 | 3.27† | 0.14 | 2.78 | 0.15 |
| Use packaged/boxed products[d] | 1.36 | 0.06 | 0.95 | 0.08 | 1.38*† | 0.10 | 1.80* | 0.14 |
| Use frozen products[e] | 2.23 | 0.06 | 1.91 | 0.11 | 2.44* | 0.11 | 2.56* | 0.14 |
| Used a recipe | 1.64 | 0.06 | 1.49 | 0.10 | 1.77 | 0.11 | 1.80 | 0.15 |
| Cooking Frequency[b] (times/week) | | | | | | | | |
| Breakfast | 2.80 | 0.07 | 2.52 | 0.13 | 3.03* | 0.14 | 3.20* | 0.18 |
| Lunch | 2.68 | 0.07 | 2.24 | 0.13 | 2.95* | 0.14 | 3.31* | 0.18 |
| Dinner | 4.45 | 0.07 | 4.31 | 0.12 | 4.81* | 0.12 | 4.72* | 0.14 |

Note: Models are adjusted for cooking perception categories, gender, age, race/ethnicity, education, SNAP/ WIC status, employment status, and marital status. Survey weights are used to generate nationally representative estimates.

[a] Cooking perception categories are based on cooking factors derived from 14 cooking perception statements, which began "I would say I have cooked, if I…[X]". Responses were measured on a 7-point Likert scale from "strongly disagree" to "strongly agree".

[b] Cooking and eating frequency of meals ranged from 0-7+ days per week.

[c] Such as fresh vegetables, or raw meats.

[d] Such as boxed macaroni and cheese, Hamburger Helper, or Rice-a-Roni (boxed pasta or rice products with a flavor packet included which are combined with other ingredients such as milk or butter).

[e] Such as frozen vegetables, fish or meats.

* Difference from scratch ingredients only significant at $p<0.05$

† Difference from all (scratch ingredients, convenience foods and no heat) significant at $p<0.05$

# Chapter 5 Appendix

## Ch. 5 Appendix Table 1: Unweighted and Weighted Characteristics of Study Samples Surveys Compared With National Rates.

| | Home Cooking Survey (*n* = 1,112) | | | National Rates |
|---|---|---|---|---|
| | ***n*** | **Unweighted Percent** | **Weighted Percent** | **Percent** |
| Individual characteristics | | | | |
| Female (*n* [%]) | 567 | 51.0 | 51.8 | 52.4 |
| Age (*n* [%]) | | | | |
| Age 18–24 | 97 | 8.7 | 11.3 | 11.3 |
| Age 25–34 | 173 | 15.6 | 17.9 | 16.7 |
| Age 35–44 | 167 | 15.0 | 17.5 | 16.7 |
| Age 45–54 | 205 | 18.4 | 17.0 | 19.0 |
| Age 55–64 | 239 | 21.5 | 18.9 | 17.3 |
| Age 65+ | 231 | 20.8 | 17.4 | 18.9 |
| Race (*n* [%]) | | | | |
| White only | 792 | 71.2 | 65.5 | 82.4 |
| Black only | 106 | 9.5 | 11.5 | 9.9 |
| Other | 87 | 7.8 | 7.8 | 7.7 |
| Hispanic ethnicity (*n* [%]) | | | | |
| Hispanic | 127 | 11.4 | 15.2 | 11.3 |
| Non-Hispanic | 985 | 88.6 | 84.8 | 88.7 |
| Education (*n* [%]) | | | | |
| <High school diploma | 97 | 8.7 | 12.4 | 13.0 |
| High school diploma | 319 | 28.7 | 29.6 | 30.3 |
| Some college | 319 | 28.7 | 28.7 | 28.7 |
| Bachelor's degree or higher | 377 | 33.9 | 29.2 | 28.0 |
| Household income (*n* [%]) | | | | |
| Under $10,000 | 44 | 4.0 | 5.0 | 6.8 |
| $10,000–$24,999 | 135 | 12.1 | 12.9 | 16.8 |
| $25,000–$49,999 | 226 | 20.3 | 22.5 | 26.2 |
| $50,000–$74,999 | 210 | 18.9 | 18.4 | 19.2 |
| $75,000+ | 497 | 44.7 | 41.2 | 30.9 |
| Employment status [*n* [%]) | | | | |
| In the labor force | 709 | 63.8 | 65.0 | 65.5 |
| Employed | 642 | 57.7 | 57.3 | 60.6 |
| Unemployed | 67 | 6.0 | 7.7 | 4.9 |
| Not in the labor force | 403 | 36.2 | 35.0 | 34.5 |
| Retired | 237 | 21.3 | 18.1 | NA |
| Other (e.g., disabled, homemaker, other) | 166 | 14.9 | 16.9 | NA |
| Marital status (*n* [%]) | | | | |
| Married | 623 | 56.0 | 51.8 | 55.3 |
| Not married | 489 | 44.0 | 48.2 | 44.7 |
| Region (*n* [%]) | | | | |
| Northeast | 212 | 19.1 | 18.2 | 18.4 |

| | | | | |
|---|---|---|---|---|
| Midwest | 254 | 22.8 | 21.3 | 21.7 |
| South | 408 | 36.7 | 37.1 | 36.7 |
| West | 238 | 21.4 | 23.4 | 23.2 |
| Internet access (*n* [%]) | 924 | 83.1 | 77.8 | 75.0 |

Comparison data extracted from the December 2011 Current Population Survey, cited in http://www.knowledgenetworks.com/knpanel/docs/GfK-KnowledgePanel%28R%29-Demographic-Profile.pdf.

## Ch. 5 Appendix Table 2: Original 18 cooking perception items.

| | I would say I have cooked, if I... | Factor |
|---|---|---|
| 1 | …microwaved store-bought frozen items such as chicken nuggets, vegetables, french fries, or fish. | 1 |
| 2 | …used boiling water to make pasta or noodles with sauce from a jar. | 1 |
| 3 | …used boiling water to make boxed macaroni and cheese, Cup Noodles®, Top Ramen®, or Rice-a-Roni®. | 1 |
| 4 | …used the stove to heat a can of soup without combining or adding other ingredients. | 1 |
| 5 | …used the microwave to defrost frozen meals such as a Stouffer's® or Lean Cuisine® meal. | 1 |
| 6 | …used the oven to heat up store bought frozen or packaged items such as chicken nuggets, french fries, or fish. | 1 |
| 7 | …made something on the stove or oven using mostly scratch or fresh ingredients. | 2 |
| 8 | …used boiling water to make pasta or noodles with both fresh and canned or jarred ingredients. | 2 |
| 9 | …followed a recipe. | 2 |
| 10 | …grilled hamburgers using patties that I made and formed myself. | 2 |
| 11 | …chopped vegetables to make a salad and used a store-bought salad dressing. | 3 |
| 12 | …made a salad with already cut, washed, bagged, or canned ingredients and store-bought salad dressing. | 3 |
| 13 | …chopped fresh vegetables to make a salad and made my own salad dressing. | 3 |
| 14 | …made a salad with already cut, washed, bagged, or canned ingredients and made my own salad dressing. | 3 |
| 15 | …made a cold sandwich | dropped |
| 16 | …mixed packaged, boxed, or canned ingredients without adding fresh or frozen ingredients. | dropped |
| 17 | …made something in the microwave using mostly scratch or fresh ingredients | dropped |
| 18 | …grilled hamburger patties that I bought pre-formed and frozen | dropped |

Note: Cup Noodles® and Top Ramen® are dried noodles and a flavor packet that is prepared by adding boiling water. Rice-a-Roni® is a box of instant rice with a seasoning packet that is prepared with boiling water and butter. Stouffer's® and Lean Cuisine® are both brands with a variety frozen dinner products.

## Ch. 5 Appendix Table 3: Final factor analysis results.

| I would say I have cooked, if I.… | PATTERN MATRIX | | | | STRUCTURE MATRIX | | |
|---|---|---|---|---|---|---|---|
| | Factor 1 | Factor 2 | Factor 3 | Uniqueness | Factor 1 | Factor 2 | Factor 3 |
| …microwaved store-bought frozen items such as chicken nuggets, vegetables, french fries, or fish. | 0.8017 | -0.1457 | 0.1053 | 0.3189 | 0.8131 | 0.0523 | 0.3494 |
| …used boiling water to make pasta or noodles with sauce from a jar. | 0.6246 | 0.4431 | -0.0801 | 0.3655 | 0.6806 | 0.5326 | 0.3325 |
| …used boiling water to make boxed macaroni and cheese, Cup Noodles®, Top Ramen®, or Rice-a-Roni®. | 0.7715 | 0.1073 | -0.045 | 0.3892 | 0.7753 | 0.2393 | 0.2888 |
| …made something on the stove or oven using mostly scratch or fresh ingredients. | -0.1575 | 0.9006 | 0.0051 | 0.2162 | 0.0196 | 0.872 | 0.3056 |
| …chopped vegetables to make a salad and used a store-bought salad dressing. | 0.1274 | 0.1497 | 0.6698 | 0.3608 | 0.4091 | 0.4421 | 0.7777 |
| …made a salad with already cut, washed, bagged, or canned ingredients and store-bought salad dressing. | 0.4205 | -0.1938 | 0.6199 | 0.3324 | 0.6166 | 0.1357 | 0.7011 |
| …chopped fresh vegetables to make a salad and made my own salad dressing. | -0.2632 | 0.3395 | 0.6663 | 0.3577 | 0.0541 | 0.5545 | 0.7027 |
| …used boiling water to make pasta or noodles with both fresh and canned or jarred ingredients. | 0.4697 | 0.5561 | -0.0174 | 0.3821 | 0.5713 | 0.6405 | 0.3819 |
| …used the stove to heat a can of soup without combining or adding other ingredients. | 0.8087 | -0.0571 | 0.0051 | 0.3578 | 0.7995 | 0.1022 | 0.2872 |
| …used the microwave to defrost frozen meals such as a Stouffer's® or Lean Cuisine® meal. | 0.7752 | -0.175 | 0.0696 | 0.3854 | 0.7674 | 0.0036 | 0.2921 |
| …made a salad with already cut, washed, bagged, or canned ingredients and made my own salad dressing. | 0.1119 | 0.0507 | 0.7011 | 0.4036 | 0.3862 | 0.3526 | 0.7636 |
| …followed a recipe. | -0.0056 | 0.7432 | 0.0886 | 0.3892 | 0.1723 | 0.7775 | 0.3834 |
| …used the oven to heat up store bought frozen or packaged items such as chicken nuggets, french fries, or fish. | 0.7951 | 0.0492 | -0.0113 | 0.3572 | 0.8004 | 0.1993 | 0.3082 |
| …grilled hamburgers using patties that I made and formed myself. | 0.0343 | 0.7488 | 0.0674 | 0.3816 | 0.2053 | 0.7824 | 0.3795 |

**Rotated Factor Loadings**

| | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Factor 1 | 1 | | |
| Factor 2 | 0.1945 | 1 | |
| Factor 3 | 0.3771 | 0.3995 | 1 |

Note: Factor analysis with oblique rotation and polychoric correlation matrix.

# CHAPTER 6. PERSPECTIVES ON LEARNING TO COOK AND PUBLIC SUPPORT FOR COOKING EDUCATION POLICIES IN THE UNITED STATES: A MIXED METHODS STUDY

(Manuscript 3)


## Abstract

**Context:** Declines in cooking skills in the United States may contribute to poor diet quality and high obesity rates. Little is known about how Americans learn to cook or their support for cooking education policy.

**Methods:** We used a concurrent, triangulation mixed-methods design that combined qualitative focus group data (from 7 focus groups in Baltimore, MD (N=53)) with quantitative survey data from a nationally representative, web-based survey (N=1,112). We analyzed the focus group data (using grounded theory) and the survey (using multivariable logistic regression) to examine how Americans learn to cook, attributions of responsibility for teaching children how to cook, and public support for policies to teach cooking skills.

**Findings:** Relatively few Americans learn to cook from formal instruction in school or community cooking classes; rather, they primarily learn from their parents and/or by teaching themselves using cookbooks, recipe websites or watching cooking shows on television. Women were more likely than men to learn to cook from their parents (mostly from mothers). While almost all Americans hold parents and other family members

responsible for teaching children how to cook, a broad majority of the public supports requiring cooking skills to be taught in schools either through existing health education (64%) or through dedicated home economics courses (67%). Slightly less than half of all Americans (45%) support increasing funding for cooking instruction for participants in the Supplemental Nutrition Assistance Program (SNAP).

**Conclusions:** Most Americans teach themselves to cook or learn from their parents. There is broad public support for teaching cooking skills in schools. However, school-based strategies should be complemented with alternatives that facilitate self-learning. Cooking education should promote improved diet quality to potentially reduce obesity and diet-related diseases. More research is needed to identify effective means of teaching and disseminating the key cooking skills and knowledge that support healthy eating.

## Introduction

In the United States (U.S.), poor diet quality [188,189], and the associated high rates of obesity and diet-related diseases [190,191], particularly among populations with low socio-economic status (SES) [192,193], have prompted increasing attention to the need to improve cooking skills among the general public [33,68,69,194]. An emerging literature supports the importance of cooking for good health. Frequent cooking at home is associated with consumption of a healthier diet [78], particularly among households with high socioeconomic status (SES) [169], and cooking at home is increasingly promoted as an obesity prevention measure [31,32,195]. However, Americans consume more food away from home, more convenience foods (both of which are typically energy dense and of lower nutritional value)[14,91,196] and spend less time cooking now than in the past [26,75]. Evidence

suggests that these trends may have contributed to reduced prevalence and use of cooking knowledge and skills in the general population [43,111,113], which may decrease the inter-generational transfer of cooking skills from parents to their children [45,103]. Despite the importance of cooking for a healthy diet, little is known about where or how Americans learn to cook or about public support for school- or community- based policies and programs to develop cooking skills.

Several policies or programs include a focus on cooking education. For example, since 1969, the Expanded Food and Nutrition Education Program (EFNEP) has provided low-income families with nutrition education, using peer educators from the community, aimed at addressing food insecurity, hunger, and, more recently, obesity [120]. In recent years, EFNEP has increasingly focused on building cooking knowledge and skills (e.g., through cooking demonstrations and taste testing). EFNEP receives an annual allocation of $68 million in federal funding (in some cases supplemented by additional state and local funds) [121]. Another example is the relatively new education program associated with the Supplemental Nutrition Assistance Program called SNAP-Ed. This program began in 1992 with approximately $660,000 in funding and has grown each year since [122]. SNAP-Ed received $408 million in federal funding in 2016 [122], and also focuses, in part, on encouraging home cooking and building cooking skills among participating families [123,124]. In public schools, compulsory culinary education or home economics, has been widely eliminated, however, cooking knowledge and skills are sometimes included in nutrition curricula [68]. In some localities, non-profit or community organizations offer school-based cooking education programs as well [34,35]. Most recently, the Scientific Report of the 2015 U.S. Dietary Guidelines Committee recently recommended that age

appropriate nutrition and food preparation education be mandatory in primary and secondary schools [197].

Systematic evaluations of school- and community- based cooking education interventions are beginning to emerge. Among children, cooking programs appear to positively influence children's food-related preferences, attitudes, and behaviors [47]. Among adults, programs which aim to increase cooking at home appear to improve dietary intake, knowledge/skills, cooking attitudes and self-efficacy/confidence, and health outcomes; although more research is needed [46].

To craft effective cooking education programs, it is important to understand where Americans typically obtain their cooking knowledge and skills. Limited evidence from the U.K., suggests that adults, particularly women, often learn to cook from their mothers rather than in schools or other places of formal instruction [103,106]. This work further suggests that cooking classes play a more important role in knowledge acquisition among individuals with low SES while self-teaching through cook books is more common among higher educated individuals [45,106]. Whether these patterns are consistent with practices in the U.S. or after the proliferation of cooking resources on the Internet and on television is unknown.

This study uses a mixed method approach that combines focus groups and national survey data. We first examine how adults in the U.S. learn to cook, overall and by gender and educational attainment. We next explore public perspectives on who is responsible for teaching children how to cook and public support for policies to teach cooking knowledge and skills. We particularly focus on cooking education polices in public schools and the SNAP program as they are generally well suited to provide this

knowledge transfer on a large scale, as well as because improved skills among these groups may help to foster a healthier population over time. To our knowledge, this is the first study in the U.S. to examine these questions using a mixed-methods approach and a nationally representative sample. This approach is advantageous because it allows us to make generalizable estimates using nationally representative survey data while also taking advantage of rich qualitative data that provides context for and deeper understanding of the survey findings.

## Methods

This study used a concurrent, triangulation mixed methods design [150,153,198]. We collected both qualitative and quantitative data on how people learn to cook and quantitative data on public support for cooking related policies. We collected qualitative data from focus groups first and then fielded a nationally representative survey several months later. We analyzed both data sources separately then compared results. We present the quantitative and qualitative results together, using the qualitative results to provide nuance and context for the interpretation of the quantitative data. This study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

### *Qualitative Data- Focus Groups*

We conducted seven focus groups (N=53) in two neighborhoods in Baltimore, MD between November, 2014 and January, 2015. More detailed information on site selection, participant recruitment and selection, and data collection is available elsewhere.[182] Briefly, we recruited participants from one neighborhood with higher median income residents who had convenient access to healthy food and participants

from another neighborhood with lower income residents who had lower access to healthy food. We recruited participants to share their perceptions about cooking using flyers that solicited a broad array of cooking experiences (the flyer stated "love to cook, hate to cook, cook all the time or not at all"). We accepted participants who fit the inclusion criteria (over 18 years old and living in the recruitment neighborhood (based on self-report)) on a first come first served basis.

A single discussion guide consisting of open-ended questions was developed by the research team and evolved throughout data collection as topics or opinions raised in the initial groups were incorporated for use with later groups. This semi-structured approach provided consistency in content across all groups while also allowing for flexibility to both react to the dynamics of each discussion and incorporate new findings into subsequent groups. The focus groups each lasted approximately 90 minutes and were moderated by the lead author.

*Qualitative Analysis*

Focus groups were audio recorded and transcribed verbatim. The lead author coded each transcript using a grounded theory approach [151]. Coding began without any codes defined *a priori* and followed an iterative and inductive process [151]. First, line-by-line initial codes were defined. Transcripts were revisited multiple times as new initial codes were identified. Then, initial codes were grouped into focused codes, and finally into broad themes or categories. Three main themes regarding perspectives on learning to cook were identified: 1) family influences on learning to cook; 2) teaching yourself to cook; and 3) media sources of cooking knowledge. Comparisons were made throughout the analysis by neighborhood and by demographic characteristics. The qualitative data

analysis software HyperRESEARCH 3.7.2 (ResearchWare, Randolph, MA) was used to facilitate coding, data management, and analysis.

### *Quantitative Data- Survey*

We designed a web-based survey to measure cooking perceptions, attitudes, practices, how people learn to cook, and support for cooking related policies. We fielded the survey in April 2015 using the survey research firm GfK's KnowledgePanel [160]. This GfK panel is commonly used for survey research to generate nationally representative estimates of attitudes and behaviors for numerous public health topics [161,163,164,199]. The study sample was drawn from GfK's approximately 50,000 panel members who are recruited through equal probability, address-based sampling from a sampling frame covering 97% of U.S. households (including households with unlisted telephone numbers, or without landlines) [160]. Households without internet access are given a computer and an internet connection from GfK [160]. The survey completion rate, the proportion of panel members invited to complete the survey who did so, was 73%. More detail about the survey design and national representativeness of the respondents is available elsewhere [200].

#### *Measures*

All of the measures described below were self-reported, and the order of the survey questions and their component parts (where applicable) were randomized.

##### Learning to cook

Respondents were shown the stem "I learned to cook from…" followed by 14 potential sources of cooking skills/knowledge. Respondents could choose either yes or no

for each of the 14 items. We then grouped the 14 items into 6 sources of cooking information: 1) mom or dad (asked about separately); 2) friend/relative or spouse (friend/spouse/partner, grandmother, other relative); 3) taught self (taught myself, trial and error); 4) cookbooks or websites (cookbooks, recipe websites); 5) cooking shows; and 6) in school or cooking class (school or cooking class). For example, "mom or dad" was coded as 1 if respondents answered "yes" to either mom or dad, and was coded as 0 if they answered "no" to both mom and dad. Respondents were also asked whether they learned to cook from some other means or if they didn't know how to cook/didn't learn from anyone.

Responsibility attributions

Respondents were asked how much responsibility they believe the government, the food industry, schools, or parents and other relatives/family members each have for teaching children how to cook. Responses were recorded on a 7-point Likert scale from 1 ("hardly any") to 7 ("a great deal"). Attributions of responsibility were examined across the full distribution of the scale and using dichotomous measures (based on the cut points in the data) coded as 1 if the respondents answered 5 or higher (indicating above neutral responsibility attribution) and 0 if they chose 4 or lower (indicating neutral or very little responsibility attribution).

Policy support

Support for three cooking related policies was measured on a 7-point Likert scale from 1 ("strongly oppose") to 7 ("strongly support"). The policy statements were the following: 1) require cooking skills to be taught as part of standard health education in public schools; 2) require public schools to offer home economics classes to teach

students how to cook and shop for healthy food; and 3) increase funding for cooking classes for people receiving SNAP, or food stamps, which is a government program to help low-income families buy food. These policy alternatives were selected because they are large scale approaches that have already been implemented and could be expanded [123], or, in the case of home economics, have already been proposed [37,68,69,119]. Dichotomous variables indicating support for each policy were created and coded (based on the cut points in the data) as 1 if respondents answered 5 or higher (somewhat support, support or strongly support) and 0 if they chose 4 or lower (neither support or oppose, somewhat oppose, oppose, or strongly oppose).

Cooking perceptions

The degree to which respondents conceptualize cooking as including convenience foods, scratch ingredients, or not using heat was measured on a 7-point Likert scale from 1 ("strongly disagree") to 7 ("strongly agree"). These conceptualizations were identified using factor analysis described in more detail elsewhere [200]. Briefly, we asked respondents to respond to 18 statements to measure their perception of the meaning of cooking. Respondents were shown the following introduction: "There are many ways to prepare meals. Below are some examples of different ways people prepare meals. Indicate how strongly you agree or disagree that the following activities are cooking. There are no right or wrong answers." Then, respondents read the phrase, "I would say I have cooked if I…." followed by descriptions of different combinations of food preparation activities and ingredients or products. After performing factor analysis, we averaged the responses to the statements that loaded onto each factor resulting in three

continuous variables measuring cooking perceptions (level of agreement that convenience foods, scratch ingredients, or not using heat count as cooking).

Demographic and socio-economic covariates

Covariates included gender, age (18-29, 30-44, 45-59, 60+), race/ethnicity (White, Black, Hispanic, Other), education (high school diploma or less, some college, college degree or more), and household income (under $40,000, $40,000 or more). We also collected information on political party affiliation (Republican, independent/moderate, Democrat).

*Quantitative Analysis*

First, we used multivariable logistic regression models to examine the associations between the socio-demographic covariates and the six sources of cooking information. The six sources of cooking information outcomes were modeled separately, and each one included the other five options as covariates in the model. Models also controlled for sex, age, race/ethnicity, education, household income, and perceptions of the meaning of cooking. All covariates were included regardless of significance based on prior literature [45,200]. We used post estimation margins to estimate the predicted sources of cooking information by gender and educational attainment. Next, we examined the unadjusted distribution of the responsibility attribution and policy support measures. We tested differences in responsibility attributions by gender and educational attainment using chi-squared tests. Finally, we used multivariable logistic regression to examine policy support adjusting for the socio-demographic covariates described above as well as responsibility attributions (using the full 7-point scale), and political party affiliation. We used post estimation margins commands to estimate predicted policy support for each

policy overall and by gender, educational attainment, and political party affiliation. All analyses were conducted with Stata, version 13 (Stata-Corp LP, College Station, TX) and used GfK provided survey weights to produce nationally representative estimates. Significance was assessed at $p<0.05$.

## Results

The characteristics of the study samples are presented in **Table 1**. The majority of the 53 focus group participants were female (74%), Black (66%), not working or retired (62%), and not married or living with a partner (66%). Forty-one percent of focus group participants had a high school education or less, 23% had attended some college, and 37% were college graduates. The mean age of the focus group participants was 51 years. Among the 1,112 survey respondents, the mean age was 47 years, 52% of the sample was female, 66% were White, 42% had a high school diploma or less, 32% were low income, and 22% self-identified as Republicans, and 46% identified as Moderates or Independents.

### *How adults in the U.S. learn to cook- national survey results*

Self-reported sources of acquiring cooking skills stratified by gender (from the survey) are reported in **Figure 1**. Non-aggregated responses can be found in **Appendix Figure 1.** The majority of Americans (66%) learned to cook from their parents. However, significantly more women than men learned to cook from their parents (72% vs. 61%, $p<0.001$), and more learned to cook from their mothers (64%) than from their fathers (19%) (see **Appendix Figure 1**). Whereas fewer men learned to cook from their parents, a higher percentage of men than women learned to cook from other family members, friends or from their spouse (51% vs. 45%, $p=0.05$).

More than two-thirds of adults (67%), with no difference by gender, taught themselves to cook. This included experimenting via trial and error and seeking new knowledge and recipes. Significantly more women than men learned to cook by using cookbooks or online recipe websites (57% vs. 38%, $p<0.001$). Relatively few adults learned to cook through formal instruction either in school or other cooking classes, though this was more common among women compared to men (17% vs. 13%, $p=0.05$). Roughly one-third (28%) of adults learned to cook by watching cooking shows, with no difference by gender.

**Figure 2** presents differences in how adults learned to cook stratified by educational attainment. Adults with a college degree were more likely to teach themselves to cook than those with a high school education or less (73% vs. 64%, $p=0.01$). As compared to adults with a high school education or less, those with a college education were more likely to learn using cookbooks or cooking websites (53% vs. 46%, $p=0.03$), and adults with at least some college are more likely learn to cook by watching cooking shows (32% vs. 24%, $p=0.01$). Regardless of education level, similar percentages of participants learned to cook from their parents and other relatives, friends and spouses. The full model results are available in **Appendix Table 1**.

***How adults in the U.S. learn to cook- focus group results***

These survey results are generally consistent with findings from the focus groups. Learning to cook from family members (mostly mothers, fathers, spouses, and grandparents) emerged as a prominent theme among both men and women in the focus groups. Many participants talked about their mother's cooking, though several women also spoke about learning to cook from their fathers (none of the male participants

mentioned learning to cook from their fathers), and among men, learning to cook from grandmothers and other female relatives was common.

*"I learned to cook from my dad... he was a cook in the army. So I used to watch him, well, he made sure all the girls watched him, so we learned from him how to cook."*

-High school educated female, low income/food access neighborhood

*"My grandmother was the one that had me in the kitchen as a young kid, and she told me to learn how to cook because I might be by myself, I might not get married, and I might get a woman that don't know how to cook."*

-Male with less than a high school education, low income/food access neighborhood

Male and female participants from both neighborhoods had positive memories about cooking with their parents and other family members and many seemed quite nostalgic while recounting these memories. Participants discussed learning specific recipes or techniques from their mothers:

*"My mother taught me how to do the homemade biscuits with the flour rolling, putting them in the oven…. She taught me how to wash my greens, take a little baking soda, put it in and clean them. Put my meats in, put a little water, let it boil and start cooking before I add the greens and stuff. I learned a lot."*

-High school educated female, high income/food access neighborhood

However, in spite of these positive memories, and the strong influence of family, learning to cook from family members did not conflict with teaching one's self to cook, Many participants reported learning specific recipes or skills from family members that they

still used often for special occasions or holiday cooking. However, the way they wanted to cook and eat in their daily lives differed from the home cooked meals they ate growing up, and therefore, they "taught themselves" how to cook by seeking out new recipes (via cookbooks or the Internet), learning from friends, or experimenting on their own when they became adults and moved out on their own, got married, started a family, or when they needed to change their eating habits due to health concerns later in life. Similar to the survey results, teaching one's self to cook (and cooking differently from one's parents/family) emerged as a stronger theme among higher educated focus group participants.

> *"The way I cook is very different from the way my parents cooked or the meals we cooked in the home when I was growing up…. I didn't really learn to cook until I was on my own and had to do it for myself. And luckily I had a lot of friends who were good cooks and so mostly I would observe them when I was invited, I would go early and watch them and want to help."*
>
> -College educated male, high income/food access neighborhood

> *"I totally took the baking from my mom and my grandma and there are recipes at Christmas time and whatever that I know how to bake because I sat there with my mom and we made black bottoms together…That was the first thing that I ever made at the age of 6, melting the butter and the chocolate on the stove… I remember making macaroni and cheese from scratch with my mom, fried chicken with my mom. But it's funny because I wouldn't actually say that I learned to cook from my parents or my mom. I learned certain recipes, but in terms of technique*

*and whatnot, I only learned that by seeing that it was a technique by watching TV or reading a recipe."*

-College educated female, high income/food access neighborhood

In contrast, other participants discussed not actually learning to cook until they became adults and had moved out on their own. A few participants discussed teaching themselves to cook in the absence of having learned from family.

*"I didn't learn from my mother or my sister. I learned by living on my own, because you have to eat. Didn't have money to afford to buy outside food all the time, so I learned by trial and error on my own. That's how I learned the little bit of cooking I do."*

-High school educated male, low income/food access neighborhood

Few focus group participants brought up formal cooking education either in schools or through a class in the context of how they learned how to cook. Rather, participants primarily emphasized using trial and error, cookbooks, recipe websites, magazines, or in some cases, television cooking shows to teach themselves how to cook. Seeking cooking knowledge, skills or new recipes from these sources occurred either in the absence of having learned from family or because participants did not want to cook (and eat) the way they had learned from their parents and other family members. Focus group participants who preferred to follow a recipe (rather than experimenting or improvising) discussed using a variety of information sources (including magazines, cookbooks, and websites), and in some cases a great deal of energy and time, to find new recipes and ideas.

*"I tend not to have a lot of confidence in experimentation. So I tend to cook a lot from blogs on the Internet, and I like to look at recipe aggregate sites, and I do a lot of research and poking around."*

- College educated female, high income/food access neighborhood

The role of cooking shows in how people learn to cook was not straightforward among this group of participants. For some, cooking shows were a source of new ideas, information and education. Others had fond childhood memories of learning basic cooking skills while watching cooking shows with their parents. For others, cooking shows were more akin to entertainment.

*"In some ways the Food Network almost makes it almost too complex and unattainable, and it's really a form of entertainment as opposed to basic things."*

-College educated female, high income/food access neighborhood

*"Like [other participant] said, the cooking shows, they show you different ways of cooking certain types of foods. You know? And you learn from that, and you try it, you like it. And then sometimes you forget the way you would make it!"*

-College educated female, low income/food access neighborhood

***Responsibility attributions and policy support for teaching cooking skills- national survey results***

**Figure 3** presents unadjusted survey results showing the percent of the public, stratified by education, which holds the government, the food industry, schools, and parents/ other family members responsible for teaching children how to cook. Overall, 15% of adults hold government responsible for teaching children how to cook. Less educated adults (with a high school degree or less) were more likely to attribute

responsibility to the government as compared to more educated Americans (p=0.004). Compared to views on the governments' role, more adults held the food industry (24%) and schools (42%) responsible for teaching children how to cook. The overwhelming majority (90%) of U.S. adults identified parents and other family members as responsible for teaching children how to cook, with those with more education more likely to hold parents responsible (p<0.001). There were no differences between men and women.

**Table 2** presents survey results showing public support for two school-based policies and one SNAP policy to teach cooking skills. Requiring schools to teach cooking skills as part of standard health education was supported by 64% of the public, and requiring schools to offer home economics classes to teach students how to cook and shop for healthy food was supported by 67% of the public. Thee results did not differ based on gender or political party affiliation. Higher education was associated with increased support for both policies; those with a college degree had significantly higher support for both policies than those with a high school degree or less (require teaching cooking in health education: 68% vs. 61%, p=0.03; require home economics classes: 71% vs. 64%, p=0.03).

Overall, roughly half of the public (45%) supported increasing funding for cooking classes for people receiving SNAP benefits, though support for this policy alternative varied by education and political party affiliation. Americans with some college education (46% vs. 37%, p=0.02) and those with at least a college degree (53% vs. 37%, p<0.001) expressed more support than those with a high school diploma or less. Democrats expressed higher support for teaching cooking skills to SNAP participants compared to both Republications (51% vs. 38%, p=0.001) and Moderates/Independents

(51% vs. 43%, p=0.02). The full distribution across the 7-point scale of the responsibility attributions and policy support are available in **Appendix Table 2**.

***Responsibility attributions and policy support for teaching cooking skills- focus group results***

Focus group participants also identified the food industry, school and parents as primary sectors for change that each hold responsibility for teaching children to cook.

> *"I think we have to fix the food industry. We have to fix healthcare. We have to give moms more time. Make more time in general whether its moms, dads, whomever. They have to have the time to shop. They have to have more farmers markets to shop from and have more time to get in that kitchen and prepare. And, again, they probably may need more education, more awareness."*
>
> -Female with some college education, high income/food access neighborhood

Many participants from both the high and low income/food access neighborhoods recognized that structural issues (food affordability and availability) make cooking difficult for families and require government intervention or changes from the food industry. However, participants from both neighborhoods also identified a lack of cooking knowledge and skills among members of their communities as a barrier to both current cooking practices and the development of cooking skills in the next generation. In the lower income neighborhood, this observation was mostly directed towards younger people, whereas in the higher income neighborhood, this observation was applied more broadly. While focus group participants recognized structural issues, responsibility and blame was placed squarely on parents for a perceived decline in cooking knowledge and

interest in young people. Therefore, the need for cooking education in schools was recognized as being necessary to help children learn to cook due to a perceived decline in cooking and absence of strong parental cooking knowledge and skills.

> *"I think a lot of people need to be a little more educated on food and look at some of the programs that they have to offer about eating healthy and everything like that because I believe back in the day people was living longer because people would go out and pick their own tomatoes, their own corn, their own greens… people need to take time out and eat healthier."*
>
> -High school educated male, high income/food access neighborhood

> *"I think educate- like also doing it at school. If you get kids into it, that's just everything. Because cooking is so fun but if you never- if your parents don't cook and then the only people you see cooking are celebrity chefs then it just becomes something that is not part of what you do."*
>
> -College educated female, high income/food access neighborhood

## Discussion

In this mixed methods study, which leveraged data from focus groups and a nationally-representative survey, we explored how adults in the U.S. learn to cook, who they hold responsible for teaching children how to cook, and public support for policies to teach children and SNAP participants how to cook. To our knowledge, this is the first study to examine these topics using this approach. We found that relatively few Americans learn to cook from formal instruction in school or community cooking classes; rather, they primarily learn from their parents and/or are self-taught (e.g., cookbooks, recipe websites, watching cooking shows on television). While almost all Americans hold

parents and other family members responsible for teaching children how to cook, two-thirds of the public supports the idea of requiring cooking skills to be taught in schools either through existing health education or through dedicated home economics courses. Slightly less than half of all Americans also support increasing funding for cooking instruction for SNAP participants.

Results from this study showing that most Americans learn to cook from their parents (primarily mothers), with differences based on gender but not education, are consistent with previous work from England [45]. Our results are also consistent with evidence suggesting little difference by age in how people learn to cook [101], although we did observe some differences in the use of cookbooks (increasing incrementally with age and highest among participants over the age of 60) versus online resources (highest among participants under the age of 30) based on age. While prior studies have not examined perceptions of who is responsibility for educating the public about cooking, our results are consistent with research in the obesity literature showing that Americans primarily hold parents – and not the government, industry or schools – as responsible for addressing childhood obesity [199].

Both the survey and focus group results regarding the role of television cooking shows in how Americans learn to cook suggest that while cooking television shows are very popular and widely watched in the U.S. [201,202], many Americans view these shows as entertainment rather than as a source of information or instruction. Previous work has shown this distinction [203], classifying cooking shows into traditional domestic instructional cooking, personality driven domestic cooking, food travel programs and avant-garde programming [204], Preliminary evidence suggests that, for some, learning to

cook by watching cooking shows may be associated with higher body mass index, especially if the shows demonstrate unhealthy recipes [205]. Given the pervasiveness and popularity of cooking and food television, and our finding that almost 30% of Americans view these shows as modalities to gain skills and knowledge, further research about the impact of these shows on cooking knowledge and practices is needed. Furthermore, the cooking show format, if used to promote healthy eating habits and key skills necessary to eat healthfully in today's complex food environment, could be a promising way to communicate important cooking/healthy eating education to a wide audience.

In recent years, experts have increasingly recommended greater investment in the culinary education of America's children through teaching home economics in school [68,69,194,195]. The results from this study demonstrate broad national public support for this recommendation. Given secular trends suggested a decline in cooking knowledge and skills [102,103], reliance on the intergenerational transfer of cooking education from parent to child may become increasingly insufficient and may contribute to the poor diet quality of children in the U.S [197]. This is particularly true given our result that cooking knowledge or recipes learned from the family do not necessarily inform daily food preparation, but are more often reserved for special occasion cooking (e.g., holidays). Therefore, although Americans primarily hold parents and family responsible for teaching cooking skills to children, it is important to strengthen cooking education in schools or government nutrition programs. There is a societal interest in teaching children the skills they need to identify, choose and prepare healthy food. Importantly, formal education should include evidence-based cooking education which promotes the shopping, budgeting,

organizational, managerial, and technical skills necessary to cook healthfully in the current food system [5,22,182].

Our results indicate broad, and bipartisan, public support for such an approach which is consistent with strong support for other school-based policy approaches to addressing childhood obesity even in spite of high attributions of responsibility to parents (as seen in this study as well) [199]. This suggests that requiring home economics (and developing evidence-based curricula) in schools may be low hanging fruit among policy alternatives to address poor nutrition and obesity. However, given competing academic priorities schools must balance; limited instruction time, budgets and equipment, and facilities for teaching cooking, implementing stand alone home economics programs may not be feasible. Some have suggested integrating cooking skills education into other areas of the curriculum such as math, science, literature or history in lieu of separate home economics [68]. This pragmatic approach may be promising, but more evidence-based approaches to teaching cooking in schools are needed as are well designed evaluations as to the impact of teaching cooking skills through nutrition or health education, integrated into other courses, or through home economics.

The SNAP-Ed program already has a robust infrastructure to which cooking education can be amplified. For example, the Food and Nutrition Service at the USDA recently launched the *What's Cooking* website which provides, easily accessible, low cost recipes for SNAP participants [124]. However, the expansion of cooking demonstrations or hands-on, participatory cooking education in SNAP-Ed will require additional resources, and public support for increasing funding to teach cooking skills to SNAP participants is lower than public support for cooking education in public school. One reason for this

may be a more negative social construction of SNAP participants as compared to children [206].

It is also important to encourage other sources of learning such as self-teaching (which was as common as learning from parents) in addition to education in schools or government nutrition programs. Promoting self-taught cooking skills might be best achieved and most widely disseminated using technology such as leveraging the Internet to share cooking tips and facilitate efficient kitchen management. A further benefit of this approach is that people, particularly younger generations, are already accustomed to seeking cooking information online. Using web-based platforms and mobile app technology could develop and take advantage of strong social networks and peer effects to influence cooking practices and social norms. Technological approaches are also advantaged by the easy ability customizable information to individual characteristics, preferences and location.

***Strengths and Limitations***

The mixed methods design of this study is a particular strength, as is the inclusion of measures of how respondents understand the meaning of cooking, the absence of which is a common limitation in other studies measuring cooking outcomes [27,43], as perceptions of cooking vary considerably [5,182,200]. However, this study should be considered in light of several limitations. First, our data are cross sectional and do not allow for causal inferences. Second, web-based surveys have been criticized for incomplete coverage or selection [187]. This concern is mitigated somewhat by GfK's recruiting strategy and by the fact that they provide computers and Internet access to those without it [160]. Also, the comparison of our sample to national rates (available

elsewhere [200]) further mitigates this concern. Third, in the focus groups, and to some extent in the survey, selection bias is a concern. We did make an effort to recruit focus group participants that reflected a diversity of perspectives and experiences with cooking, but participants were composed of people who were interested in discussing the topic and the majority of them did like to cook. Fourth, this study did not objectively measure levels of cooking knowledge or skills, both of which could be important for understanding and interpreting responses to how people learn to cook. Fifth, our policy support questions about cooking instruction in schools did not ask about funding, which may have biased support estimates upwards. Finally, these results were all self reported and are potentially subject to self-reporting and social-desirability bias.

## Conclusion

In conclusion, the majority of Americans learn to cook both from their parents and by teaching themselves using cookbooks, recipe websites, or watching cooking shows on television. Although relatively few Americans learn to cook from formal cooking instruction in school or community cooking classes, there is broad support for teaching cooking skills in schools either through home economics or in existing health education curricula. Greater investment in evidence-based cooking education in public schools may be a promising and achievable approach to improving diet quality in the U.S. However, cooking education in schools should be complemented with other strategies that promote self-teaching – a common way people learn to cook. More research is needed to identify effective means of teaching and disseminating the cooking skills and knowledge that are relevant for cooking and eating healthfully in the current food system.

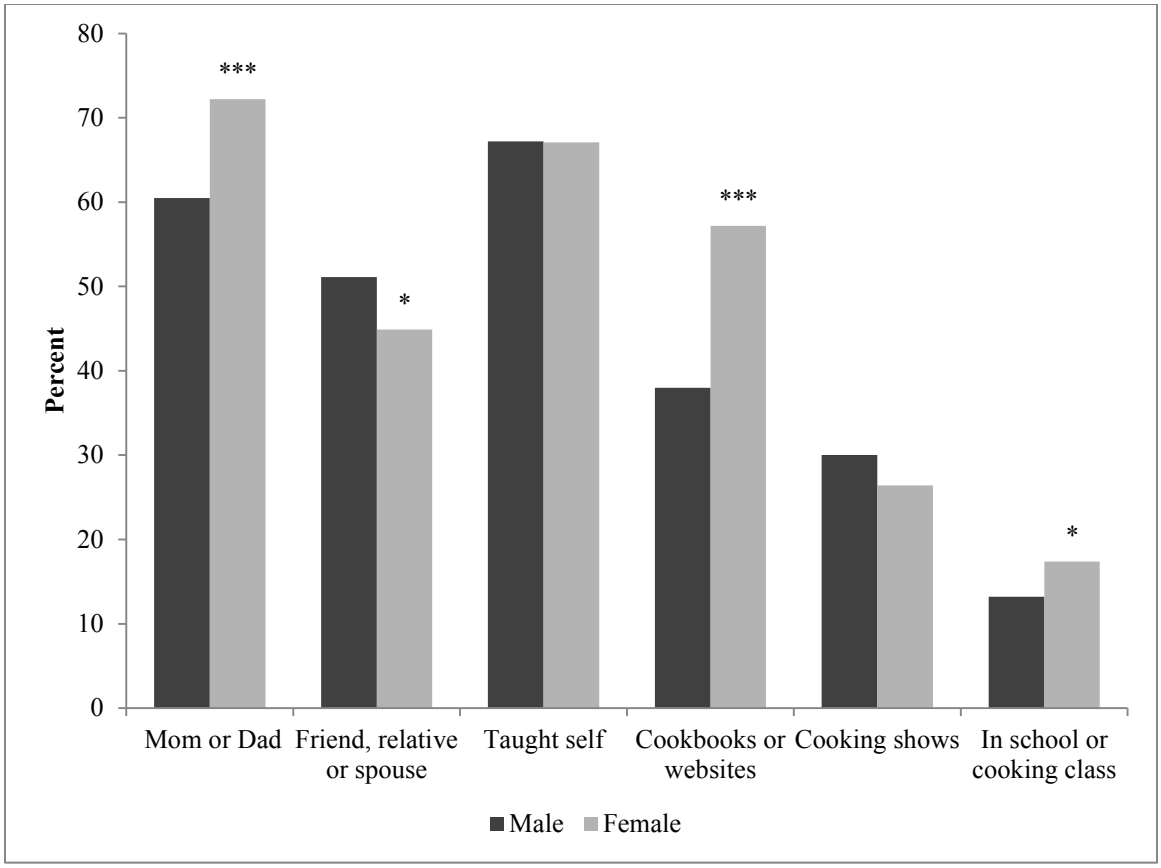
## Tables and Figures

**Table 6.1: Characteristics of the study samples.**

| | | |
|---|---|---|
| | Focus Groups | Survey |
| Number of participants [n (%)] | 53 (100) | 1,112 (100) |
| Mean age (SD) | 51 (14.8) | 46.9 (0.6) |
| Age [n (%)] | | |
| 18-29 | 6 (11) | 190 (21) |
| 30-44 | 9 (17) | 247 (25) |
| 45-59 | 23 (43) | 333 (27) |
| 60+ | 15 (28) | 342 (26) |
| Sex [n (%)] | | |
| Male | 14 (26) | 545 (48) |
| Female | 39 (74) | 567 (52) |
| Race [n (%)] | | |
| Black | 35 (66) | 106 (12) |
| White | 16 (31) | 792 (66) |
| Hispanic | 0 (0) | 127 (15) |
| Other | 2 (4) | 87 (8) |
| Education [n (%)] | | |
| Some high school | 2 (4) | 97 (12) |
| High school | 19 (37) | 319 (30) |
| Some college | 12 (23) | 319 (29) |
| College graduate | 19 (37) | 377 (29) |
| Employment [n (%)] | | |
| Working | 20 (38) | 642 (57) |
| Not working/retired | 32 (62) | 470 (43) |
| Marital status [n (%)] | | |
| Single/divorced/separated/widowed | 37 (66) | 402 (39) |
| Married | 8 (15) | 623 (52) |
| Living with a partner | 10 (19) | 87 (9) |
| Household income [n (%)] | | |
| Under $40,000 | n/a | 325 (32) |
| $40,000+ | n/a | 787 (68) |
| Political party affiliation | | |
| Republican | n/a | 267 (22) |
| Moderate/ independent | n/a | 502 (46) |
| Democrat | n/a | 335 (32) |

Note: Seven focus groups were conducted between November 2014 and January 2015 in Baltimore, MD. The results informed the content of the survey which was fielded online in April, 2015.

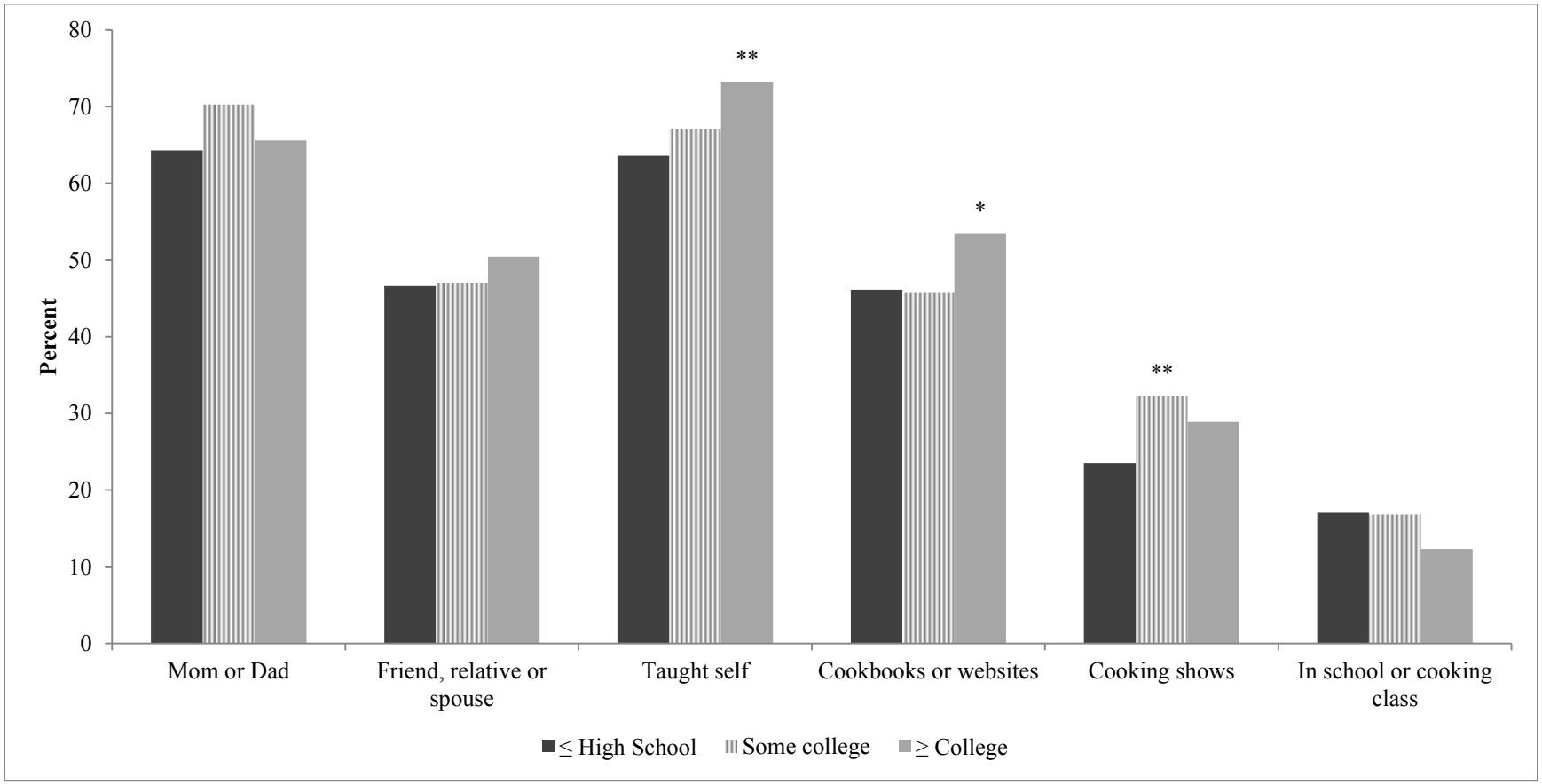
**Figure 6.1: How adults in the U.S. learn to cook[a] by gender, Home Cooking Survey, 2015 (1,112).**




Note: Models are adjusted for means of learning to cook, gender, age, race/ethnicity, education, household income, and cooking perceptions. Differences by gender significant at * p<0.05, ** p<0.01, ***p<0.001.

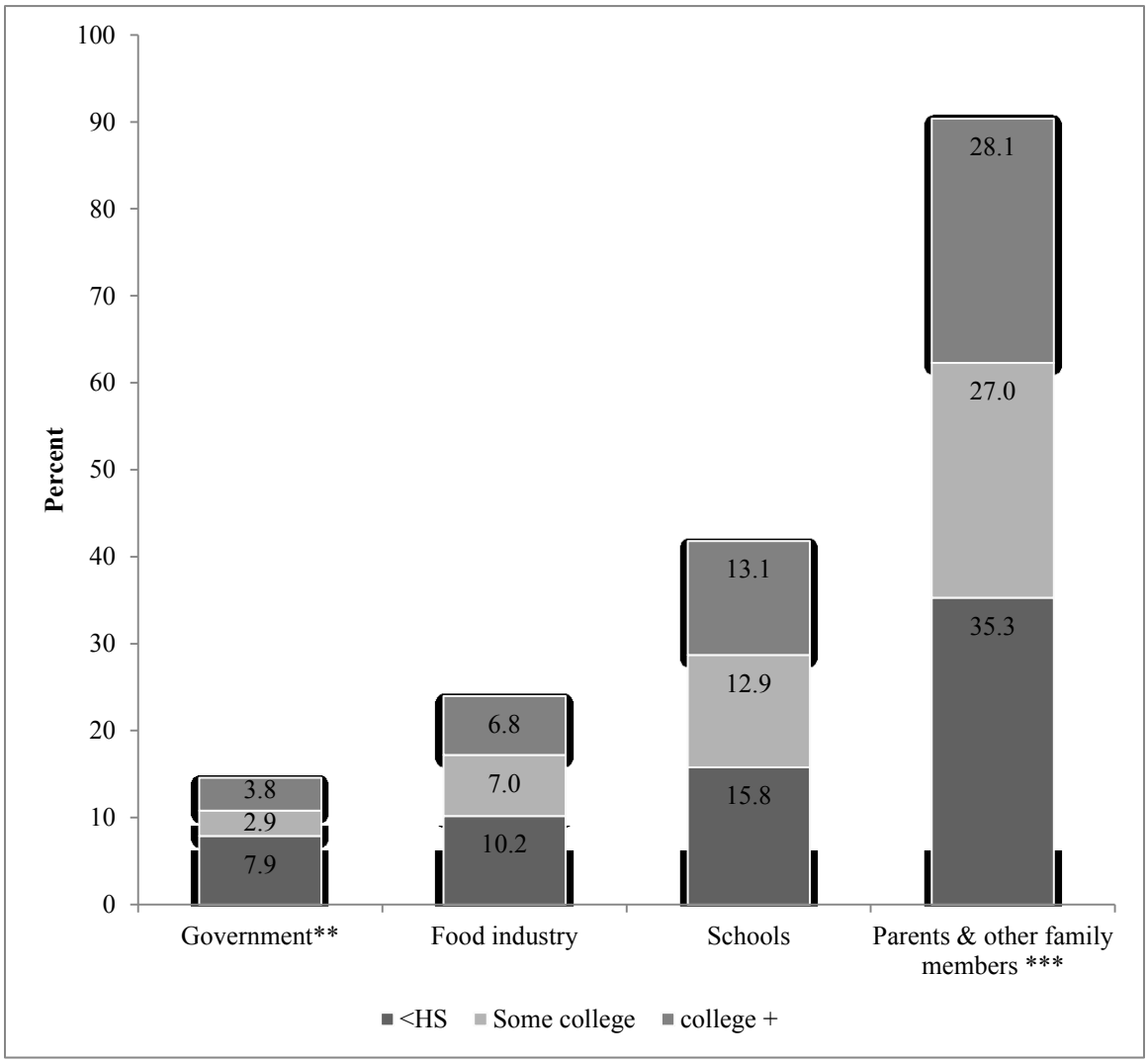
[a] Respondents were shown the stem "I learned how to cook from…" and then were shown the above options in randomized order.

**Figure 6.2: How adults in the U.S. learn to cook[a] by educational attainment, Home Cooking Survey, 2015 (1,112).**




Note: Models are adjusted for means of learning to cook, gender, age, race/ethnicity, education, household income, and cooking perceptions. Difference from those with a high school education or less significant at * p<0.05, ** p<0.01, ***p<0.001.
[a] Respondents were shown the stem "I learned how to cook from…" and then were shown the above options in randomized order.

**Figure 6.3: Percent of the American public that attributes responsibility for teaching cooking skills to government, food industry, schools and families by educational attainment, Home Cooking Survey, 2015 (N=1,112).**




Note: Responsibility is the sum of the respondents who answered ≥5 on the 7-point scale of responsibility attribution.
Differences by educational attainment significant at * p<0.05, ** p<0.01, ***p<0.001 based on chi-squared tests. There were no differences in responsibility attributions between males and females.

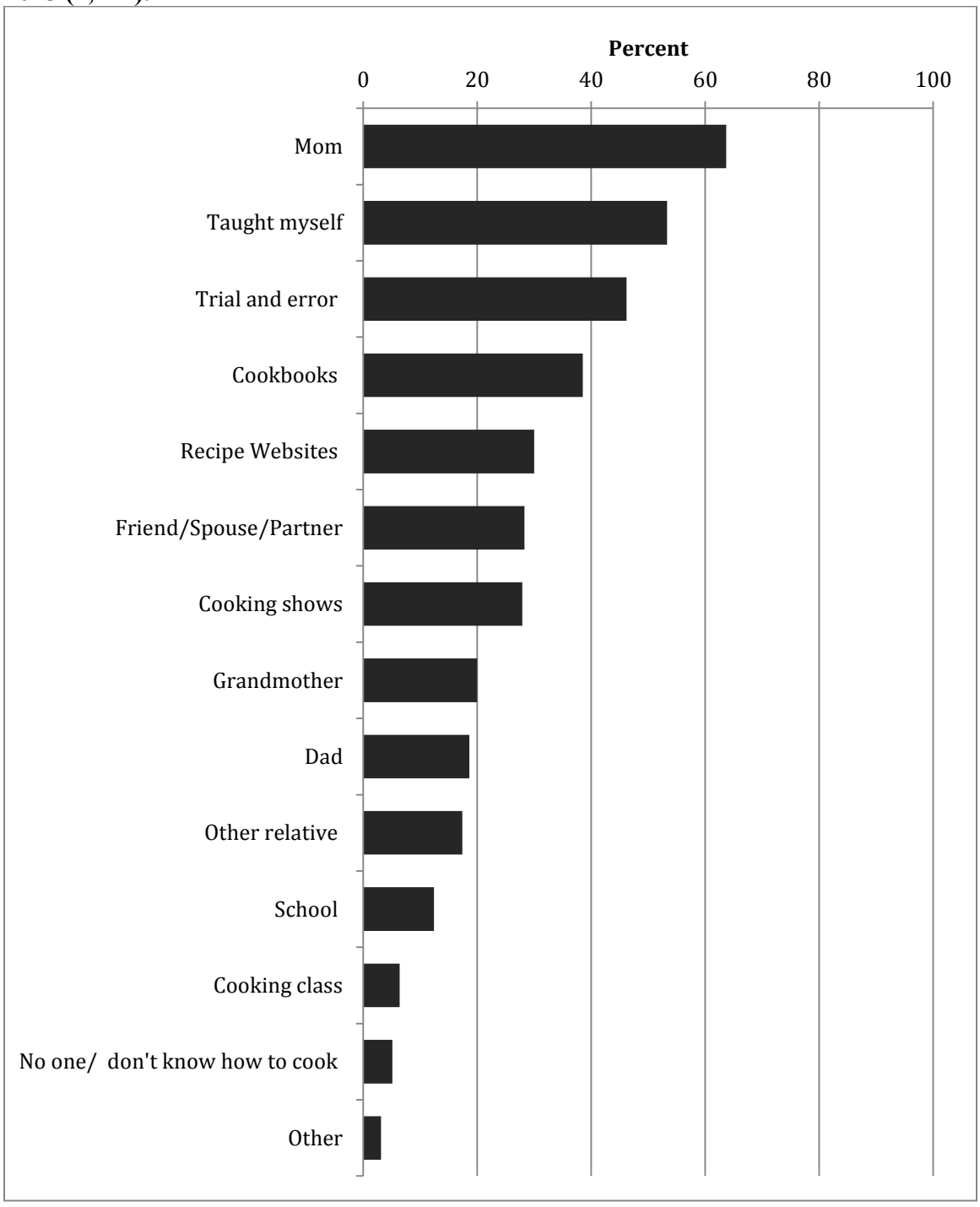
**Table 6.2: Support for cooking related policies among U.S. adults overall and by political party affiliation, Home Cooking Survey (N=1,112).**

| | Require cooking skills to be taught as part of standard health education in public schools. | Require public schools to offer home economics classes to teach students how to cook and shop for healthy food. | Increase funding for cooking classes for people receiving SNAP, or food stamps, which is a government program to help low-income families buy food. |
|---|---|---|---|
| | Mean (SEM) | Mean (SEM) | Mean (SEM) |
| Overall | 63.6 (1.3) | 66.5 (1.3) | 44.5 (1.4) |
| Gender | | | |
| Male | 62.1 (1.9) | 64.8 (1.9) | 43.4 (2.1) |
| Female | 64.9 (1.8) | 68.3 (1.9) | 45.5 (2.0) |
| Education | | | |
| ≤ high school | 60.8 (2.3) | 63.9 (2.3) | 37.1 (2.4) |
| Some college | 63.0 (2.4) | 65.8 (2.6) | 46.0* (2.8) |
| ≥College | 67.9* (2.2) | 70.9* (2.1) | 52.9* (2.4) |
| Political Party Affiliation | | | |
| Republican | 63.2 (2.7) | 65.7 (2.7) | 37.6** (3.1) |
| Moderate/Independent | 62.0 (2.0) | 64.4 (2.0) | 43.2** (2.1) |
| Democrat | 66.2 (2.4) | 70.4 (2.4) | 51.3 (2.7) |

Note: Models are adjusted for gender, age, race/ethnicity, education, household income, political party affiliation and responsibility attributions to government, the food industry, schools and parents/families. There were no significant differences by gender.
* Difference from ≤ high school education significant at $p<0.05$.
** Difference from Democrats significant at $p<0.05$.

## Appendix

**Ch. 6 Appendix Figure 1: How U.S. adults learn to cook[a], Home Cooking Survey, 2015 (1,112).**




Note: Models are adjusted for means of learning to cook, gender, age, race/ethnicity, education, household income, and cooking perceptions.

[a] Respondents were shown the stem "I learned how to cook from…" and then were shown the above options in randomized order.

**Ch. 6 Appendix Table 1: Full model results for how adults in the U.S. learn how to cook, Home Cooking Survey (N=1,112).**

| | Mom or Dad | Friend, relative or spouse | Taught self | Cookbook or websites | Cooking shows | In school or cooking classes |
|---|---|---|---|---|---|---|
| | OR [95% CI] | OR [95% CI] | OR [95% CI] | OR [95% CI] | OR [95% CI] | OR [95% CI] |
| Mom or Dad | - | 2.15*** [1.60, 2.89] | 0.66* [0.47, 0.92] | 1.54* [1.10, 2.16] | 1.39 [0.97, 2.00] | 1.47 [0.94, 2.30] |
| Friend, relative or spouse | 2.14*** [1.59, 2.88] | - | 1.21 [0.88, 1.66] | 1.92*** [1.41, 2.62] | 1.46 [1.06, 2.00] | 1.77** [1.23, 2.57] |
| Taught self | 0.66* [0.47, 0.92] | 1.24 [0.90, 1.69] | - | 3.44*** [2.42, 4.87] | 1.88** [0.15, 2.83] | 0.79 [0.51, 1.22] |
| Cookbooks or websites | 1.51* [1.08, 2.11] | 1.89*** [1.39, 2.58] | 3.39*** [2.40, 4.79] | - | 4.20*** [2.87, 6.16] | 1.95** [1.28, 2.97] |
| Cooking shows | 1.42 [0.99, 2.02] | 1.47* [1.07, 2.01] | 1.87** [1.24, 2.81] | 4.23*** [2.91, 6.17] | - | 1.42 [0.97, 2.09] |
| In school or cooking class | 1.50 [0.96, 2.34] | 1.76** [1.21, 2.54] | 0.79 [0.51, 1.22] | 1.82** [1.19, 2.79] | 1.38 [0.94, 2.05] | - |
| Gender (Male (ref.)) | | | | | | |
| Female | 1.81*** [1.35, 2.43] | 0.75* [0.57, 1.00] | 1.00 [0.73, 1.35] | 3.05*** [2.22, 4.20] | 0.80 [0.58, 1.11] | 1.42 [0.99, 2.02] |
| Age (18-29 (ref.)) | | | | | | |
| 30-44 | 0.76 [0.48, 1.19] | 1.22 [0.80, 1.85] | 1.29 [0.83, 2.01] | 0.90 [0.54, 1.49] | 1.60 [0.97, 2.63] | 1.04 [0.58, 1.87] |
| 45-59 | 1.16 [0.74, 1.80] | 1.64* [1.10, 2.43] | 1.64* [1.07, 2.52] | 0.91 [0.56, 1.45] | 1.45 [0.91, 2.31] | 0.91 [0.53, 1.56] |
| 60+ | 0.80 [0.52, 1.23] | 1.34 [0.89, 2.01] | 1.84** [1.18, 2.85] | 1.17 [0.73, 1.86] | 0.86 [0.53, 1.40] | 0.95 [0.54, 1.65] |
| Race (White (ref.)) | | | | | | |
| Black | 1.58 [0.93, 2.69] | 1.08 [0.69, 1.71] | 0.80 [0.48, 1.33] | 0.67 [0.39, 1.14] | 1.34 [0.80, 2.24] | 0.76 [0.42, 1.40] |
| Hispanic | 1.09 [0.71, 1.68] | 1.21 [0.80, 1.84] | 0.67* [0.44, 1.00] | 0.67 [0.40, 1.10] | 0.96 [0.56, 1.65] | 0.94 [0.52, 1.69] |
| Other | 0.58 [0.33, 1.01] | 0.91 [0.55, 1.49] | 0.72 [0.38, 1.36] | 1.39 [0.70, 2.76] | 1.27 [0.71, 2.27] | 0.79 [0.39, 1.57] |
| Education | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| (≤ high school (ref.)) | | | | | | |
| Some college | 1.37 [0.96, 1.96] | 1.01 [0.72, 1.42] | 1.21 [0.84, 1.74] | 0.98 [0.66, 1.45] | 1.71** [1.15, 2.52] | 0.97 [0.63, 1.50] |
| ≥College | 1.07 [0.75, 1.54] | 1.18 [0.85, 1.65] | 1.71** [1.17, 2.50] | 1.54* [1.05, 2.25] | 1.40 [0.95, 2.08] | 0.69 [0.43, 1.10] |
| Household income (<$40,000 (ref.)) | | | | | | |
| $40,000+ | 0.97 [0.70, 1.36] | 0.77 [0.57, 1.06] | 0.64** [0.45, 0.91] | 1.29 [0.91, 1.83] | 0.93 [0.65, 1.34] | 0.73 [0.49, 1.09] |
| Cooking perceptions | | | | | | |
| Convenience Foods | 0.92 [0.82, 1.03] | 1.04 [0.93, 1.15] | 0.99 [0.88, 1.12] | 0.84** [0.74, 0.95] | 0.89 [0.79, 1.01] | 0.93 [0.81, 1.07] |
| Scratch/fresh ingredients | 1.18* [1.02, 1.37] | 1.14 [0.99, 1.31] | 1.45*** [1.25, 1.69] | 1.41*** [1.17, 1.70] | 1.14 [0.96, 1.36] | 1.21 [0.96, 1.53] |
| Not using heat | 1.17** [1.04, 1.32] | 0.88* [0.78, 0.98] | 0.94 [0.83, 1.07] | 1.06 [0.93, 1.22] | 1.11 [0.97, 1.27] | 1.04 [0.89, 1.21] |

Note: OR significant at p-value

**Ch. 6 Appendix Table 2: Unadjusted attributions of responsibility for teaching cooking skills and support for policies to teach children how to cook, Home Cooking Survey, 2015 (N=1,112).**

| | Overall[a] (%) | Distribution (%) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Responsibility attribution** | **Responsible (95% CI)** | **1 Hardly any** | **2** | **3** | **4** | **5** | **6** | **7 A great deal** |
| Government | 14.6 (12.5 – 17.1) | 40.4 | 14.6 | 12.7 | 17.8 | 6.5 | 4.1 | 4.1 |
| Food and beverage industry | 23.9 (21.3 – 26.7) | 23.7 | 13.5 | 16.6 | 22.2 | 11.7 | 6.34 | 5.9 |
| Schools | 41.8 (38.7 – 44.8) | 11.5 | 8.9 | 13.0 | 24.9 | 20.3 | 12.2 | 9.3 |
| Parents and other relatives/family members | 90.4 (88.2 – 92.2) | 1.2 | 0.7 | 0.9 | 6.8 | 6.7 | 17.9 | 65.7 |
| **Policy** | **Support (95% CI)** | **Strongly Oppose** | **Oppose** | **Somewhat Oppose** | **Neither Support Nor Oppose** | **Somewhat Support** | **Support** | **Strongly Support** |
| Require cooking skills to be taught as part of standard health education in public schools. | 63.5 (60.4 – 66.5) | 3.2 | 3.3 | 4.3 | 25.7 | 23.5 | 22.7 | 17.4 |
| Require public schools to offer home economics classes to teach students how to cook and shop for healthy food. | 66.5 (63.5 – 69.5) | 2.8 | 3.3 | 4.1 | 23.3 | 22.1 | 23.4 | 21.1 |
| Increase funding for cooking classes for people receiving SNAP, or food stamps, which is a government program to help low-income families buy food. | 44.4 (41.3 – 47.5) | 8.1 | 9.0 | 7.6 | 31.0 | 18.0 | 16.1 | 10.4 |

[a] Overall responsibility and support are the sum of the respondents who answered ≥5 on the 7-point scale of responsibility attribution or policy support.

# CHAPTER 7. DISCUSSION

Substantial changes in the food system over the past century have dramatically altered not only the way Americans eat, but the way they cook as well. Cooking remains an important part of American life, and whether or how a person cooks has important implications for the healthfulness of the food they consume. In this dissertation we used mixed methods to explore the ways in which Americans perceive what it means to cook, how Americans learn to cook, and cooking confidence, attitudes and behavior. We also explored responsibility attributions for teaching children how to cook and public support for developing cooking skills in two settings- public schools and through the Supplemental Nutrition Assistance Program. The goal was not to determine a "correct" definition of cooking. Rather, we recognized that food preparation (i.e. cooking) is a key and understudied step between food acquisition and consumption and we set out to provide greater understanding of and context for the role and meaning of cooking in the modern food system in the United States.

Perceptions of what it means to cook reflect the current, complex food system, changing social norms and pressures, and the ubiquity of convenience food products in the food environment. Americans' perceptions of the meaning of cooking vary considerably and span a continuum from all scratch cooking to anything made at home. Perceptions of cooking incorporate considerations of the degree to which scratch ingredients, convenience foods and heat are used. Notably, while most Americans agree that using scratch ingredients is cooking, far fewer agree that cooking means *only* using scratch ingredients.

The way one understands the meaning of cooking is related to differences in cooking attitudes, confidence and behavior. People who include convenience foods in their definition of cooking are less likely to feel confident in their cooking abilities and less likely to have positive attitudes about cooking. Cooking confidence and enjoyment is lowest among Americans who perceive cooking as including the use of convenience foods. While the perception that using convenience foods is cooking is associated with lower confidence and negative attitudes about cooking, those with more expansive definitions of cooking (including convenience foods and/or not using heat) report cooking breakfast, lunch and dinner more frequently than those who perceive cooking to be only scratch ingredients.

Relatively few Americans learn to cook from formal instruction in school or community cooking classes; rather, they primarily learn from their parents and/or by teaching themselves using cookbooks, recipe websites or watching cooking shows on television. While almost all Americans hold parents and other family members responsible for teaching children how to cook, a broad majority of the public supports requiring cooking skills to be taught in schools either through existing health education or through dedicated home economics courses.

## Implications for public health and policy

Cooking is a complex concept and is not uniformly understood. This finding has implications for both public health policies to improve cooking and eating habits, and efforts to measure cooking behavior and its relationship to health outcomes. A greater understanding of how people learn to cook, the barriers they face in how they cook in their every day lives as well as strategies frequent cooks employ that enable them to

prepare food at home is necessary for the development of effective interventions that seek to reduce barriers to and encourage healthy cooking at home. The fact that a broad majority of Americans support teaching cooking skills in schools suggests low hanging fruit for policy action. Taken together, findings from this dissertation have implications in 4 main areas: 1) efforts to decrease barriers to healthy home cooking by increasing access to healthy food, 2) policies and programs to increase cooking knowledge and encourage healthy cooking at home, 3) public health messages about cooking as a health behavior, and 4) measurement of cooking behavior.

***Increasing access to healthy food***

Rather than poor physical access to food, the unaffordability of food may be a bigger barrier to cooking and eating a healthy diet. This contrasts with a robust literature emphasizing disparities in access to healthy food between high and low income neighborhoods and the importance of the neighborhood food environment for food choices [15,62,109,139,173]. The Healthy Food Financing Initiative and the Healthy Corner Store Network are policy responses to this literature that have sought to increase the number of stores and improve the availability of healthy products in food desert neighborhoods [174,175]. While increasing access to healthy food in underserved neighborhoods is a worthwhile goal for many reasons (particularly for increasing equity and food justice, and improving neighborhood quality), increasing physical access to food without addressing high prices of fresh produce and other healthy and desirable products may have limited impact on shifting eating (and cooking) habits. Increasing SNAP benefits and expanding programs that bolster SNAP participant's spending power (such as the Double Up Bucks program which matches SNAP spending at farmers

markets)[176], in combination with increased access to fresh, healthy food, could help lower-income individuals both afford the food they want and decrease the time they spend procuring it.

***Encourage healthy cooking at home***

Policies and programs seeking to encourage healthy cooking at home should consider the broad spectrum of activities Americans recognize as cooking as well as the range of opportunities to build cooking knowledge and skills. Cooking education in schools has strong support among the public and is a key avenue for developing important cooking skills in the next generation. More robust, and evidence based, cooking skills education tailored to developing the shopping, budgeting, organizational, managerial, and technical skills necessary to cook healthfully in the current food system is an important and achievable step towards teaching children the skills they need to identify, choose and prepare healthy food. The same is true for developing cooking skills in SNAP participants and other low-income populations through cooking education in EFNEP, SNAP-Ed and other community cooking classes. Beyond school-based instruction and other formal cooking classes, creating opportunities to help people easily self-learn may be a useful investment of resources. In addition to healthy cooking television shows, leveraging the Internet and other mobile technology to share recipes, develop and promote healthy shopping and cooking habits, and facilitate efficient kitchen management could be a cost-effective strategy to reach large segments of the population.

***Messages about cooking as a health behavior***

Public health messages about healthy eating must account for heterogeneity in perspectives about cooking which may, in turn, influence the way in which those

messages are received and interpreted by the intended audience. For example, promoting home cooking as a healthy practice may not inspire changes in behavior if people already perceive that they are cooking frequently. De-emphasizing scratch cooking may encourage cooking among those who report lack of confidence or negative attitudes towards cooking. Notably, a message focused on convenience might be considered "cheating" and not resonate among those who define cooking as the use of scratch ingredients.

Conversely, messages that focus on scratch ingredients only may not seem achievable to a wide audience. Especially for those who dislike cooking or lack confidence in their ability to cook, messages promoting more frequent cooking may not resonate. Among this group, messages about cooking and/or cooking classes might instead emphasize cooking with convenience foods that support a healthy diet (e.g., pre-cut and portioned vegetables, par-cooked rice or pastas, and pre-portioned meals with fresh ingredients and ready-made sauces) as well as building confidence and enjoyment in the process of preparing this food. Regardless, when promoting cooking as a health behavior, the public health community should be careful not to make assumptions about the meaning of cooking, or about the challenges people face during everyday cooking.

### *Measurement of cooking behavior*

The way in which people interpret the meaning of cooking has implications for how the public health field measures cooking behavior, and for how we understand the relationships between cooking, at home food consumption, diet quality, and health outcomes. Cooking behavior is typically assessed via questions about frequency of cooking dinner at home without further defining the term. However, this general measure

of cooking frequency masks important differences in more specific cooking practices. The manner in which people answer the question of how frequently they cook is related to how they conceptualize the meaning of cooking. Therefore, general measures of frequency of cooking, if they do not define or specify the kind of cooking being measured, may simplify the diversity of cooking practices and have limited usefulness in what they reveal about the specifics of what a person is actually cooking or eating. This is a particularly important consideration for the design of epidemiological surveys and evaluation instruments for the growing number of cooking class programs implemented in schools, federal nutrition assistance programs and other community programs. More specific measures of specific cooking behaviors should be developed and validated and/or surveys should define cooking when asking about cooking confidence, attitudes, knowledge, or behavior.

## Study strengths and limitations

The mixed methods design of this study is a particular strength. Mixing qualitative and quantitative methods takes advantage of the strengths and minimizes the weaknesses of both types of data [153]. The combination of focus groups and survey methods allowed for the nuances of the topics to be explored in great detail as well as within a more generalizable, nationally representative sample. This was also the first study to examine cooking perceptions and how Americans learn to cook in a nationally representative population. The dissertation addressed several important gaps in the literature, particularly by generating new knowledge about how Americans understand the meaning of cooking, the absence of which has been a common limitation in other

studies measuring cooking outcomes [27,43], as perceptions of cooking vary considerably [5,167,182].

However, this study should be considered in light of several limitations. First, our data are cross-sectional and do not allow for causal inferences about the relationship between cooking perceptions, confidence, attitudes or behavior. Second, web-based surveys have been criticized for incomplete coverage or selection [187]. This concern is mitigated somewhat by GfK's recruiting strategy and by the fact that they provide computers and Internet access to those without it. Third, selection bias is a concern in both the focus groups and the survey. In the focus groups, participants self selected into the study by responding to fliers posted in their neighborhoods. Although the fliers emphasized that we were interested in the views of people who both liked and did not like cooking, and people who cooked infrequently, the participants were composed of people who were interested in the topic, had the time to participate in the focus groups, and a majority liked to cook. The participants, themselves, observed that their cooking practices and attitudes were not representative of their social networks and broader communities. However, this was not universally the case, and we did observe a diversity of both cooking behavior and opinions about cooking among participants from both neighborhoods. For the survey, 13.9% of those invited to be part of GfK's survey panel did so, and of those panel members who were asked to complete our survey, 73% did so. However, the comparison of our sample to national rates alleviates some of this concern.

Fourth, we did not attempt to collect data on cooking skills or knowledge, both of which could be important for understanding cooking perceptions, confidence and behavior. In addition, our cooking perception measures did not comprehensively capture

the full spectrum of all possible foods and preparations that could be important for some people's definitions of cooking. For example, we did not cover specific techniques such as poaching, roasting or steaming nor did we ask about specific recipes or adaptations to packaged products. Fifth, these results were all self reported and the behavioral data are potentially subject to self-reporting and social-desirability bias. Finally, researcher bias, could have influenced the data collection, and interpretation of the focus group results. However, the use of reflexive memos throughout data collection, analysis and writing mitigates this concern. Furthermore, in qualitative research, the goal is not necessarily to eliminate this bias completely [151,159]. Rather, the goal is that the researcher, as was done in this study, should confront and recognize the perspective they bring to the study; objectivity or the existence of an objective "Truth" is not assumed.

## Implications for future research

This dissertation presents formative research on how Americans perceive the meaning of cooking and how those perceptions are related to cooking confidence, attitudes and behavior. We also explore how Americans learn to cook and their support for cooking related policies. There are several areas for future research that can build on the initial findings from this dissertation including: 1) developing a deeper understanding of cooking perceptions and attitudes among population subgroups, 2) identifying and investigating the key cooking skills and knowledge relevant for enabling healthy eating habits, 3) developing and evaluating interventions to teach those key skills, and 4) further exploring the relationship between cooking, diet quality and health.

In the current study, we described how the general public understands the meaning of cooking. Further qualitative and survey research should explore potential

demographic and regional differences in these perceptions. More research is needed to explore broader attitudes and perspectives among people who perceive cooking in different ways. Specifically, it will be important to further explore distinctions people make about what counts as cooking and why, especially among those who include using convenience foods in their definition of cooking. Insights in this area will be important for the development of interventions to build cooking confidence and mitigate feelings that cooking is burdensome and/or stressful. In addition, research on how food policy and nutrition experts perceive the meaning and importance of cooking is also warranted as these perceptions may differ in important ways from the general public's views.

Not all cooking is healthy and not all cooking skills or knowledge are equally important for cooking at home frequently or healthfully. Cooking is a complex task requiring many skills ranging from technical to the perceptual and managerial. More research is needed to identify the key cooking skills and knowledge that are relevant for cooking and eating healthfully in the current food system. Experimental and evaluation studies could help identify those key skills as well as effective means of teaching and disseminating them. Cooking knowledge and skills as well as differing experiences with learning how to cook may be related to how people perceive what it means to cook, which was not explored in this dissertation. Future research should investigate how skills and knowledge are related to cooking perceptions and demographic trends and patterns in how people cook and eat.

Incorporating cooking education in schools and other community programs has broad public support. However, future research is needed to evaluate the feasibility, implementation, and effectiveness of interventions that develop the key cooking skills

important for consuming a healthy diet. In schools, cooking education could take place in home economics courses, as part of health education, or could be incorporated into other areas of the curriculum such as math, science, literature or history. More evidence-based approaches to teaching cooking in schools are needed as are well designed evaluations as to the impact of teaching cooking skills through nutrition or health education, integrated into other courses, or through home economics. Evaluations of community cooking class programs with long-term (more than 6 months) follow-up are also needed.

Further research is needed to understand how cooking perceptions, knowledge and behavior are related to dietary intake and health outcomes. Large population surveys (such as the NHANES) that include questions about cooking practices as well as dietary intake are a good opportunity to explore trends and patterns between cooking, diet, and health outcomes overall and among population subgroups. In addition, longitudinal, experimental or quasi-experimental, and mixed-methods studies are warranted to further build the evidence base for the relationship between cooking and health. The role of convenience foods should be of particular interest in this future line of research.

## Conclusion

Cooking is a complex concept and is not uniformly understood. Policies and programs seeking to encourage healthy cooking at home should consider the broad spectrum of activities and ingredients – convenience food, scratch cooking and cold preparations- Americans recognize as cooking as well as the barriers and facilitators to preparing food at home on a daily basis. Most Americans learn to cook both from their parents and by teaching themselves and there are several opportunities throughout a person's life to intervene and provide new cooking skills and knowledge. Childhood is a

key intervention point, and a broad, bipartisan majority of Americans support teaching cooking skills in schools either through home economics or in existing health education curricula. Greater investment in evidence-based cooking education in public schools may be a promising and achievable approach to improving diet quality and obesity rates in the United States.

The way in which people interpret the meaning of cooking has implications for how the public health field measures cooking behavior, and for how we understand the relationships between cooking, at home food consumption, diet quality, and health outcomes. Understanding how people learn to cook, the barriers they face in how they cook in their every day lives as well as strategies frequent cooks employ that enable them to prepare food at home is necessary for the development of effective interventions that seek to encourage healthy cooking at home. Cooking remains an important part of American life and requires greater attention and understanding in order to improve diet quality and decrease the burden of diet-related diseases in the United States.

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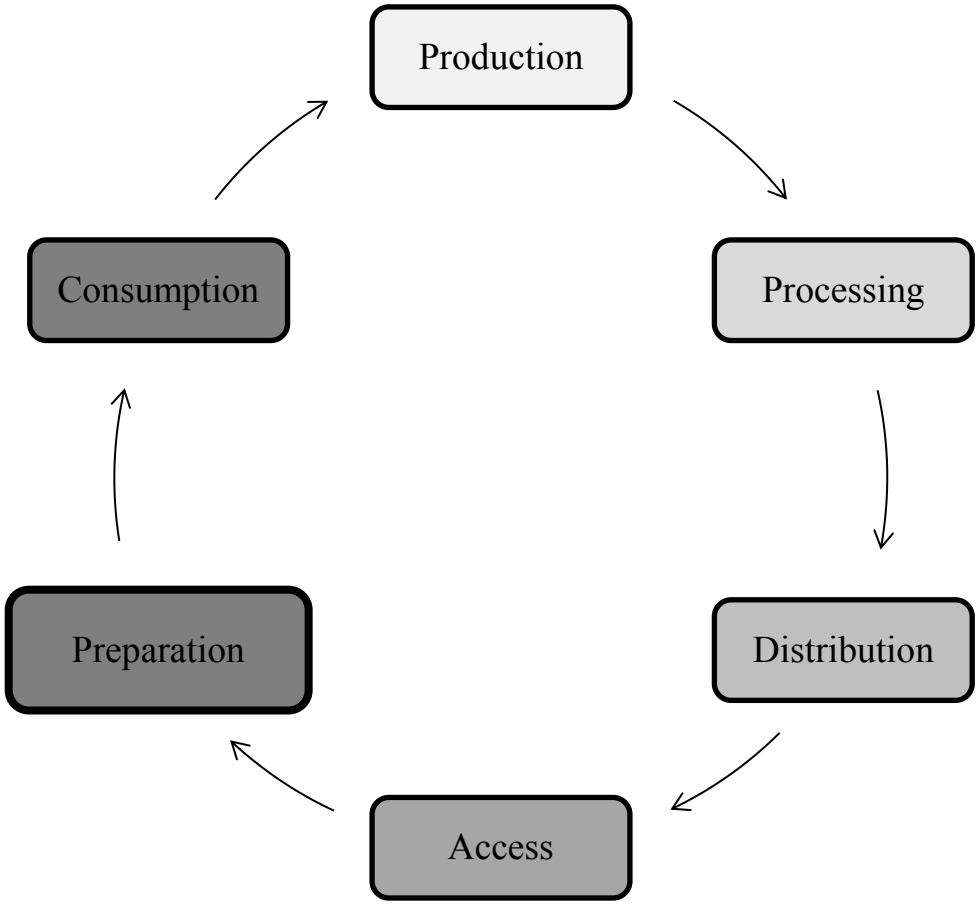
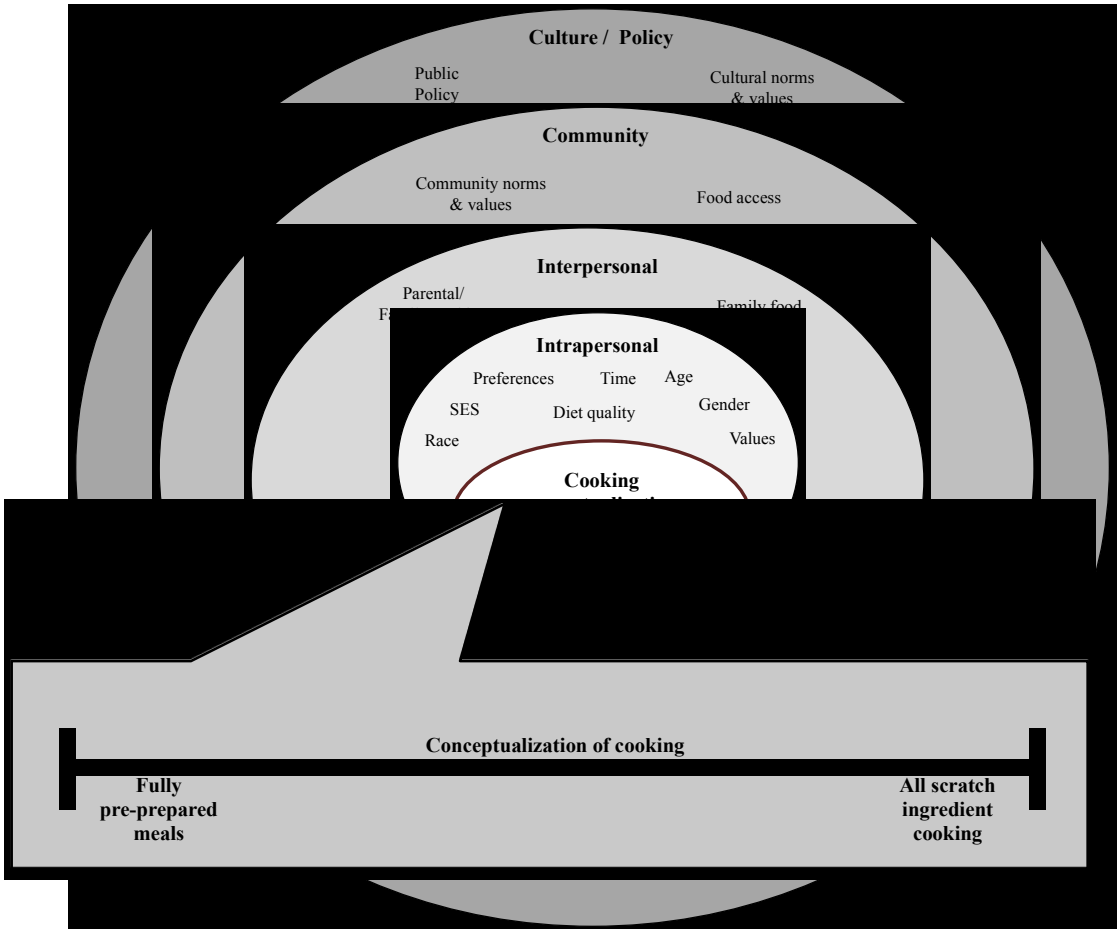
# APPENDIX

**Appendix A: Model of the place of food preparation in the food system.**



## Appendix B: Conceptual Framework of the factors influencing cooking perceptions and practices.




Note: Adapted from Davidson & Birch (2001), IOM (2005) and Fitzgerald & Spaccarotella (2009).

## Appendix C: Frequency of cooking in the United States, 1997-2012

| Survey | Data | Sample Size | Sample Description | Question Text | Results | |
|---|---|---|---|---|---|---|
| Conducted by: Princeton Survey Research Associates<br><br>Sponsored by: National Pasta Association | July 23, 1997 | 1,003 | Nationwide telephone survey of adults. | In a typical week, how many nights a week do you, yourself, cook or prepare a meal? | One-two<br>Three-four<br>Five-seven<br><br>None | 21%<br>26%<br>40%<br><br>13% |
| CBS News[1] | Oct. 30-Nov. 1, 2005 | 936 | Nationwide telephone survey of adults. | In the last week, how many nights did anyone in your household cook dinner at home? | 0 times<br>1 time<br>2 times<br>3 times<br>4 times<br>5 times<br>6 times<br>7 times | 4%<br>2%<br>6%<br>11%<br>13%<br>19%<br>12%<br>31% |
| Conducted by: International Communications Research[1]<br><br>Sponsored by: Harvard School of Public Health Project on the Public and Biological Security | May 12-June 1, 2008 | 1,509 | National telephone survey of adults including oversample of blacks and Hispanics. Weighted to be nationally representative. | How often do you prepare meals at home involving cleaning, cutting, and cooking meats and vegetables? | Every day<br>A few times a week<br>A few times a month<br><br>Hardly ever | 51%<br>37%<br>5%<br><br>6% |
| National Health and Nutrition Examination Survey[2] | 2007-2008 | 10,149 | Weighted to be nationally representative | During the past 7 days, how many times did you or someone else in your family cook food for dinner or supper at home? | 0 times<br>1 time<br>2 times<br>3 times<br>4 times<br>5 times<br>6 times<br>7 times | 5%<br>3%<br>5%<br>8%<br>13%<br>17%<br>13%<br>36% |
| Conducted by: Social Science Research Solutions[1]<br><br>Sponsored by: Henry J. Kaiser Family Foundation, Washington Post | Oct. 6 Nov. 2, 2011 | 1,936 | National telephone survey of adults including oversamples of blacks. Weighted to be representative of the general population. | In an average week, about how many nights does anyone in your household cook dinner at home? | None<br>1 night<br>2 nights<br>3 nights<br>4 nights<br>5 nights<br>6 nights<br>7 nights<br>Don't know | 3%<br>3%<br>5%<br>12%<br>16%<br>22%<br>10%<br>28%<br>1% |
| Conducted by: Social Science Research Solutions[1]<br><br>Sponsored by: Harvard School of Public Health, Robert Wood Johnson Foundation, National Public Radio | Oct. 11-Nov. 21, 2012 | 1,018 | Telephone survey of national adult caregivers of children ages 2 – 17. | Which of the following best describes (name of respondent's child's) dinner? | All or almost all 'from scratch' by cleaning, cutting, and cooking the ingredients<br>All or almost all from packaged, frozen, or prepared foods purchased at the grocery store<br>All or almost all take out | 66%<br><br>27%<br><br>6% |

[1] Roper IPoll Database (http://www.ropercenter.uconn.edu/)

[2] Virudachalam et al, 2013

## Appendix D: Focus Group Recruitment Fliers

Approved: October 9, 2014
IRB No.: 6027

**DO YOU LIVE OR WORK IN THIS NEIGHBORHOOD?**

**OPPORTUNITY TO TAKE PART IN A DISCUSSION ABOUT**

# HOME COOKING

A DOCTORAL STUDENT FROM JOHNS HOPKINS UNIVERSITY IS CONDUCTING RESEARCH ON **HOW** AND **WHY** PEOPLE COOK AND HOW PEOPLE THINK ABOUT **WHAT COUNTS AS HOME COOKING.**

**IF YOU LOVE TO COOK, HATE TO COOK, COOK ALL THE TIME OR NOT AT ALL, WE WANT TO HEAR YOUR VIEWS!**

FOCUS GROUPS WILL BE AT THE ENOCH PRATT CENTRAL LIBRARY AT 400 CATHEDRAL ST.

THE GROUPS WILL HAVE 8-12 PEOPLE AND WILL LAST ABOUT 90 MINUTES. LIGHT SNACKS AND REFRESHMENTS WILL BE SERVED.

YOU WILL RECEIVE A $40 GIFT CARD FOR YOUR TIME. PARTICIPATION IS VOLUNTARY.

**FOR MORE INFORMATION AND/OR TO PARTICIPATE, PLEASE EMAIL HOMECOOKINGSTUDY@GMAIL.COM OR CALL 443-310-1484.**

JOHNS HOPKINS
BLOOMBERG SCHOOL
*of* PUBLIC HEALTH

**Approved**: October 9, 2014
**IRB No.**: 6027

**DO YOU LIVE OR WORK IN THIS NEIGHBORHOOD?**

**OPPORTUNITY TO TAKE PART IN A DISCUSSION ABOUT**

# HOME COOKING

A DOCTORAL STUDENT FROM JOHNS HOPKINS UNIVERSITY IS CONDUCTING RESEARCH ON **HOW** AND **WHY** PEOPLE COOK AND HOW PEOPLE THINK ABOUT **WHAT COUNTS AS HOME COOKING.**

**IF YOU LOVE TO COOK, HATE TO COOK, COOK ALL THE TIME OR NOT AT ALL, WE WANT TO HEAR YOUR VIEWS!**

FOCUS GROUPS WILL BE AT THE ORLEANS PUBLIC LIBRARY AT 1303 ORLEANS ST.

THE GROUPS WILL HAVE 8-12 PEOPLE AND WILL LAST ABOUT 90 MINUTES. LIGHT SNACKS AND REFRESHMENTS WILL BE SERVED.

YOU WILL RECEIVE A $40 GIFT CARD FOR YOUR TIME. PARTICIPATION IS VOLUNTARY.

**FOR MORE INFORMATION AND/OR TO PARTICIPATE, PLEASE EMAIL HOMECOOKINGSTUDY@GMAIL.COM OR CALL 443-310-1484.**

JOHNS HOPKINS
BLOOMBERG SCHOOL
*of* PUBLIC HEALTH

## Appendix E: Focus Group Discussion Guide

### I. Introductions

*Introduce ourselves (moderator and the note taker): We are graduate students at Johns Hopkins in the School of Public Health. We are conducting a research study about how people think about how people prepare food and how they think about cooking. The goal of this discussion group is to learn more about food preparation habits, what factors influence how you prepare food and how you think about cooking. There are no right or wrong answers.*

*Ask participants to introduce themselves and provide a first name or pseudonym.*

*Icebreaker:* What is your favorite food or cooking memory?

### II. Food preparation practices and history

1. What was the last meal you cooked? Why did you choose it? How did you make it?

    *Probe: Is this typical for you?*

    *Probe: Do you think this is typical of most people?*

    *Probe: What influences the way you prepare meals? Bring up food access, food prices, taste preferences, time, enjoyment, ease of preparation?*

2. Is the way you cook similar to the way your family cooked when you were growing up?

    *Probe: If yes, in what way is it different?*

    *Probe: If yes, why is it different?*

    *Probe: What about your family today?*

3. What kinds equipment and food preparation techniques do you use?
   *(use photos of different equipment, products and techniques to illustrate)*

4. How did you learn how to cook?

    *Probe: Ask about mothers, grandmothers, fathers, school, home economics classes, recipes/cookbooks, cooking shows?*

5. How have your cooking habits changed over time?

*Probe: Have there been specific things in your life that have changed the way you prepare food?*

## III. Perceptions of cooking

6. How do you feel about cooking?

   *Probe: Do you enjoy cooking? Does it stress you out? Is cooking work? Is it fun?*

   *Probe: How do you feel about the way you cook? Do you think you are good cook? Are you confident in your cooking skills?*

   *Probe: What are your favorite and least favorite things about cooking?*

7. What does home cooking mean to you?

   *Probe: How is home cooking different from cooking in general? If at all?*

   *Probe: What about scratch cooking?*

   *Probe: In surveys, people report that they cook very frequently, like six or seven nights a week. Based on your experience what kinds of food preparation activities do you think they are talking about?*

8. What kinds of things do you consider when deciding whether or not something was homemade?

   *Probe: What about packaged foods or frozen foods?*

9. How would you describe meals made with these things? Are they homemade? Is this cooking? Or something else? Is there no difference?
   *(use photos or actual products as props to illustrate and guide the discussion)*

10. What are some of the challenges you face when it comes to cooking?

    *Probes: Ask about confidence, time, skills, enjoyment, cost, food access, meal planning/organization, preferences of family members.*

    *Probe: What equipment is necessary to cook?*

11. Is cooking important to you? Why or why not?

    *Probe: Is it important for health? For family? For some other reason?*

12. Some people promote eating more home cooked meals as a way to eat healthier. What do you think about this recommendation?

    *Probe: What is the most useful way to help people cook more at home?*

    *Probe: For you personally, or others in your community, what changes would you like to see that would help people cook more?*

**IV. Conclusion**

*We've covered a lot and I appreciate your insights. I want to make that everyone has an opportunity to provide any additional ideas.*

13. Is there anything else you would like to add or that you think we should know about cooking

## Appendix F: Focus Group Demographic Questionnaire

*Please fill in or circle the choice that best describes you.*

**1. What is your first name (or alias): _____**

**2. What is your age: _____**

**3. What is your gender:** Male Female

**4. How do you describe yourself?** Black Hispanic White Other

**5. What is the highest grade or degree you have completed or received?**

Some high school High school Some college College graduate

**6. Right now, are you?**

Single Married Living with a partner Divorced, separated or widowed

**7. Right now, are you?**

Working part time Working full time Not working/retired

**8. Do you have children?** Yes No

**8a. If yes, how many? _____** **8b. How old? _____**

**9. How would you describe your weight status?**

Underweight Healthy weight Overweight Overweight by more than 20 lbs.

**10. Are you currently trying to lose weight?** Yes No

**11. How many days in an average week do you, or someone in your household cook dinner? _____**

**12. In your home, do you have a working** (circle all that apply):

Stove Oven Microwave Refrigerator Freezer

## Appendix G: Home Cooking Survey (Parts 1 and 3)

### PART I. COOKING

#### A. Cooking Conceptualization

**[RANDOMIZE]**

Q1. There are many ways to prepare meals. We are interested in what cooking means to you. Below are some examples of different ways people prepare meals. Based on how you think about what activities you consider "cooking", indicate how strongly you agree or disagree with the following statements.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |

I would say I have "cooked" a meal, if …

| | |
|---|---|
| 1. | I mixed packaged, boxed, or canned ingredients without adding fresh or frozen ingredients. For example, making a pizza using store-bought dough, shredded cheese, and sauce from a jar. |
| 2. | I microwaved store-bought frozen items such as chicken nuggets, pizza, french fries, burritos, or burgers. |
| 3. | I boiled water to make pasta or noodles with sauce from a jar. |
| 4. | I boiled water to make boxed macaroni and cheese, Cup Noodles®, Top Ramen®, or Rice-a-Roni®. |
| 5. | I made something on the stove or oven using mostly scratch or fresh ingredients. |
| 6. | I made something in the microwave using mostly scratch or fresh ingredients. |
| 7. | I made a sandwich. |
| 8. | I chopped vegetables to make a salad and used a store-bought salad dressing. |
| 9. | I made a salad with already cut, washed, bagged, or canned ingredients and store-bought salad dressing. |
| 10. | I chopped vegetables to make a salad and made my own salad dressing. |
| 11. | I boiled water to make pasta or noodles with both fresh and canned or jarred ingredients. |
| 12. | I grilled hamburger patties that I bought pre-formed and frozen. |
| 13. | I used the stove to heat a can of soup without combining or adding other ingredients. |
| 14. | I used the microwave to defrost frozen meals such as a Stouffer's® or Lean Cuisine® meal. |
| 15. | I made a salad with already cut, washed, bagged, or canned ingredients and made my own salad dressing. |

| | |
|---|---|
| 16. | I followed a recipe. |
| 17. | I used the oven to heat up store bought frozen or packaged items such as chicken nuggets, pizza, french fries, burritos or burgers without combining or adding other ingredients. |
| 18. | I grilled hamburgers using patties that I made and formed myself. |

## B. Cooking Perceptions and Confidence

**[RANDOMIZE]**

Q2: Based on how you think about cooking, how confident are you that you could _____?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all Confident | | | | | | Extremely Confident |

| | |
|---|---|
| 1. | cook from scratch using fresh ingredients |
| 2. | follow a recipe |
| 3 | cook healthy meals |
| 4. | prepare a meal using a vegetable that I have never used before |
| 5. | cook a meal that does not have any meat or meat products |

**[RANDOMIZE]**

Q3. For the following statements, indicate how strongly you agree or disagree.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |

| | |
|---|---|
| 1. | I enjoy cooking. |
| 2. | Cooking takes too much time. |
| 3. | Cooking costs too much money. |
| 4. | Cooking meals at home helps me eat more healthfully. |
| 5. | I am a good cook. |
| 6. | Cooking is important to me. |
| 7. | Cooking is a burden or chore. |
| 8. | Cooking is stressful. |
| 9. | Cooking for others makes me feel happy. |
| 10. | I would like to cook at home more than I do now. |

| | |
|---|---|
| 11. | I don't like to shop for food. |

**[RANDOMIZE]**
Q4. I learned to cook from <fill in from below.> [Yes/no- check all that apply]

| | |
|---|---|
| 1. | my mom |
| 2. | my dad |
| 3. | my grandmother |
| 4. | a friend, spouse, or partner |
| 5. | watching cooking shows |
| 6. | reading cookbooks |
| 7. | in school |
| 8. | recipe websites |
| 9. | a cooking class |
| 10. | other |
| 11. | No one, I do not know how to cook. |

## C. Cooking Behavior

**[RANDOMIZE]**
Q5. For the next items, indicate how many times during the past 7 days <u>you, or someone in your household,</u> did the following.
1 2 3 4 5 6 7

| | |
|---|---|
| 1. | Cooked breakfast. |
| 2. | Cooked lunch. |
| 3. | Cooked dinner. |
| 4. | Made a meal from scratch by starting with fresh ingredients (such as fresh vegetables, raw meats, etc.). |
| 5. | Made a meal using packaged products such as boxed macaroni and cheese, Hamburger Helper®, or Rice-a-Roni®. |
| 6. | Made a meal using frozen products such as frozen vegetables, fish, or meats. |
| 7. | Used a recipe to make a meal. |
| 8. | Tried making a recipe I've never made before. |

Q6. On the next item, indicate how many times during the past 7 days you did the following.

1 2 3 4 5 6 7

| | |
|---|---|
| 1. | Ate home-cooked leftovers for breakfast. |
| 2. | Ate home-cooked leftovers for lunch. |
| 3. | Ate home-cooked leftovers for dinner. |

Q7: Indicate how many times during the past 7 days you: <drop down 1-21>

| | |
|---|---|
| 1. | Ate frozen meals or frozen pizza. |
| 2. | Ate fast food. |
| 3. | Ate at dine-in/sit down restaurants (not fast food). |
| 4. | Ate carry-out, take-out, or delivery, such as pizza or Chinese food. |

Q8: On a typical **weekday** evening, how much time do you, or someone else in your household, usually spend on cooking dinner and cleaning up after the cooking? (Do NOT include time spent eating.)*

_____ Minutes

Q9: On a typical **weekend** evening, how much time do you, or someone else in your household, usually spend on cooking dinner and cleaning up after the cooking? (Do NOT include time spent eating.)*

_____ Minutes

## PART III. POLICY SUPPORT

### D. Policy Items

**[RANDOMIZE ITEMS]**

Q19. There are many different ways to help people eat healthier. Some experts recommend cooking at home more and eating less meat as a way to promote healthy eating. Which of these strategies would you support and which would you oppose?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly oppose | Oppose | Somewhat oppose | Neither support nor oppose | Somewhat support | Support | Strongly support |

| |
|---|
| 1. Require cooking skills to be taught as part of standard health education in public schools. |
| 2. Increase funding for cooking classes for people receiving SNAP, or food stamps, which is a government program to help low-income families buy food. |
| 3. Require public schools to offer home economics classes to teach students how to cook and shop for healthy food. |
| 4. Require schools to serve a meatless meal every Monday. |
| 5. Require schools to make the portions of meat in the school lunch program smaller. |
| 6. Encourage large institutions such as hospitals to serve a meatless meal every Monday. |

**[RANDOMIZE OPTIONS]**

Q20. Please indicate how much responsibility you believe each of the following should have for teaching children how to cook.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Hardly any | | | | | | A great deal |

1) Government
2) Food and beverage companies
3) Schools
4) Parents and other relatives/family members

## IV. Food access:

Q21. How long does it take you to get to your usual grocery store (distance one-way)?

a) 0-5 minutes
b) 5-10 minutes
c) 10-20 minutes
d) 20-30 minutes
e) 30-40 minutes
f) more than 45 minutes

Q22. How do you usually travel to get your usual grocery store?

a) Walk
b) Drive my own car
c) Someone gives me a ride
d) Bus
e) Taxi
f) Other public transportation

**[RANDOMIZE]**

Q23. How often does _____ make it difficult for you to get healthy foods (healthy food includes fruits and vegetables, whole grains, beans and legumes, low-fat dairy, and lean meats)?

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | never | rarely | sometimes | often | always |
| 1. | distance to the store | | | | |
| 2. | lack of transportation | | | | |
| 3. | hours the store is open | | | | |
| 4. | price | | | | |
| 5. | physical disabilities | | | | |
| 6. | time available to go shopping | | | | |
| 7. | selection of items available | | | | |
| 8. | quality of items available | | | | |

Q24. Approximately how much money did your household spend on groceries last month?

$_____

Q25. Are you, or someone in your household, currently receiving: <yes/no>

a. SNAP or food stamp benefits
b. WIC benefits

c. TANF benefits
d. SSI (Supplementary Security Income)
e. School breakfast/lunch

## V. Equipment:

**[RANDOMIZE]**
Q26. When you prepare food, how often do you use:

| 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| don't own/ does not work | never | rarely | sometimes | often | always |

1) Stove
2) Oven
3) Microwave
4) Hot plate
5) Grill
6) Kitchen knives
7) Pots/pans
8) Cutting board
9) Freezer
10) Electric kettle

Q27. Do you have a working:
1) refrigerator

# CURRICULUM VITAE

**Julia Alexandra Wolfson**
Born: August 15, 1979
Los Angeles, CA

## EDUCATION

| | |
|---|---|
| Feb. 2016 | PhD, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD<br>Department of Health Policy and Management<br>Dissertation: "What's cooking? A mixed methods analysis of cooking perceptions, practices, and the implications for food policy." |
| May 2012 | MPP, University of Southern California, Los Angeles, CA<br>Sol Price School of Public Policy<br>Practicum Project: "Creating healthy corner stores: An analysis of factors necessary for effective corner store conversion programs." |
| May 2001 | BA, New York University, New York, NY<br>Gallatin School of Individualized Study<br>Senior Colloquium Title: "The Individual in Society"<br>*magna cum laude* |

## PROFESSIONAL EXPERIENCE

### *Research*

| | |
|---|---|
| July 2015- present | Research Assistant to Prof. Stephen Teret<br><br>*Department of Health Policy & Management, Johns Hopkins Bloomberg School of Public Health*<br>Conducted analyses and wrote manuscript examining survey data on public views about smart guns. Collaborated on the study design, data analysis and drafting of a report assessing the legal and policy landscape regarding the use of technology for school safety. |
| Oct. 2012- present | Research Assistant to Dr. Sara Bleich<br><br>*Department of Health Policy & Management, Johns Hopkins Bloomberg School of Public Health*<br>Conducted data analysis and contributed to the drafting of several manuscripts for projects using large datasets including: the National Health and Nutrition Examination Survey (focused on trends in sugary beverages) and the MenuStat Project (focused on trends in calories and nutrients on menus in large chain restaurants). Collaborated on design, implementation, and data analysis of an evaluation of an American Heart Association community cooking class program. |

| | |
|---|---|
| May 2013- Oct.2014 | Research Assistant to Dr. Colleen Barry<br>*Department of Health Policy & Management, Johns Hopkins Bloomberg School of Public Health*<br>Performed data analysis and drafted manuscript for a study using survey data to examine the role of parents in public views of strategies to address childhood obesity in the U.S. |
| Dec. 2013- Aug. 2014 | Research Assistant to Dr. Emma (Beth) McGinty<br>*Department of Health Policy & Management, Johns Hopkins Bloomberg School of Public Health*<br>Coded the data and contributed to drafting the manuscript for a quantitative content analysis of media coverage of background check policies in the year after the Sandy Hook school shooting in Newtown, CT. |
| June-Aug. 2012 | Research Assistant to Dr. Katharine Strunk and Dr. Patricia Burch<br>*USC Center for Educational Governance, University of Southern California*<br>Conducted data analysis of Principal and school staff surveys on school plan implementation as part of USC's i3 grant to evaluate the Los Angeles Unified School District's Public School Choice Initiative. |
| 2011-2012 | Research Assistant to Dr. Gary Painter<br>*Sol Price School of Public Policy, University of Southern California*<br>Conducted data analysis of US Census data for a longitudinal analysis of immigration and housing trends from 1980-2010. Created maps using GIS to graphically illustrate trends. |

***Policy & Practice***

| | |
|---|---|
| Sept. 2013- present | J&J Community Health Scholar<br>*Johnson & Johnson Community Healthcare Scholars Program, Johns Hopkins Bloomberg School of Public Health*<br>Provide training and technical assistance to Action for Healthy Kids, a Chicago-based non-profit organization, to build their capacity for in-house monitoring and evaluation of their school-based program to reduce childhood obesity and improve the school food environment. |
| June- Sept. 2013 | Consultant<br>*Salad Bar Program, Department of Food and Nutrition, Baltimore City Public Schools*<br>Implemented a new salad bar program as part of the school lunch program in Baltimore City Public schools. Trained cafeteria managers and staff in the field. Drafted policies and standard operating procedures to scale up the program to be implemented in 140 schools during the 2013-14 school year. |

| | |
|---|---|
| July- Nov. 2011 | Research Analyst Intern<br>*Community Health Councils, Los Angeles, CA*<br>Conducted research and stakeholder engagement for a Health Impact Assessment (HIA) of proposed fast food regulation in South Los Angeles. Facilitated steering committee meetings for the HIA team. Developed survey instruments and associated training materials for HIA primary data collection. |
| Dec. 2010- Aug. 2011 | Graduate Research Intern<br>*Los Angeles Food Policy Council, Los Angeles, CA*<br>Conducted background research in preparation of a county-wide foodshed assessment study. Developed survey instruments for community outreach in support of the Los Angeles Food Hub project. Co-authored a foodshed/ food system study literature review with recommendations to the "Good Food Economy" working group of the Food Policy Council. |

***Culinary***

| | |
|---|---|
| Fall 2013 | Volunteer Fellow<br>*Microgreens, Mother Seton Academy, Baltimore, MD*<br>Taught 8-week cooking class program to seventh grade students. |
| 2009- 2012 | Executive Chef and Owner<br>*ChefJuliaWolfson.com: Private Chef and Culinary Consulting, Los Angeles, CA*<br>Part-time catering, private chef and culinary consulting business. |
| 2008-2009 | Executive Chef<br>*Ammo Restaurant, Los Angeles, CA*<br>Created seasonally changing menus of farm to table creative American cuisine. Managed all kitchen operations including a staff of 14. Received 2.5 stars from the LA Times restaurant critic in July 2008. |
| 2006-2007 | Chef de Cuisine<br>*Applewood Restaurant, Brooklyn, NY*<br>Created daily changing menus utilizing seasonal and local produce and animals. Performed whole animal butchery. Managed all kitchen operations. |
| 2003-2006 | Chef de Partie (line cook)<br>*Blue Hill Restaurant, New York, NY*<br>*Le Bernardin Restaurant, New York, NY*<br>*Union Pacific Restaurant, New York, NY* |

## PEER-REVIEWED PUBLICATIONS

**Wolfson JA**, Teret SP, Frattaroli S, Miller M, Azrael D. The public's preference for safer guns. *American Journal of Public Health.* Jan 21: e1-e3 (E-pub ahead of print) PMID: 26794170

**Wolfson JA**, Clegg Smith K, Frattaroli S, Bleich SN. Public perceptions of cooking and the implications for cooking behavior in the United States. *Public Health Nutrition.* Jan22:1-10 (E-pub ahead of print) PMID: 26794207

**Wolfson JA**, Bleich SN, Clegg Smith K, Frattaroli S. What does cooking mean to you?: Perceptions of cooking and factors related to cooking behavior. *Appetite*. 97:146-54. PMID: 26654888

Bleich SN, **Wolfson JA**, Jarlenski MP, Block J. (2015) Restaurants with calories displayed on menus had lower calorie counts compared to restaurants without such labels. *Health Affairs.* 34:1877-84. PMID: 26526245

Bleich SN, Jones-Smith JC, **Wolfson JA**, Xiaozhou Zhu, Story M. (2015) The complex relationship between diet and health. *Health Affairs.* 34:1813-20. PMID: 26526238

McGinty EE, **Wolfson JA**, Sell TK, Webster DW. (2015) Common sense or gun control? Political communication and news media framing of firearm sale background checks after Newtown. *Journal of Health Politics, Policy and Law.* E-pub ahead of print. PMID: 26567381

Bleich SN, **Wolfson JA**, Jarlenski MP. (2015) Calorie changes in large chain restaurants: Declines in new menu items but room for improvement. *American Journal of Preventive Medicine.* E-pub ahead of print. PMID: 26163168

**Wolfson JA,** Bleich SN. (2015) Fruit and vegetable consumption and food values: National patterns in the United States by Supplemental Nutrition Assistance Program eligibility and cooking frequency. *Preventive Medicine*. 76(0):1-7. PMID: 25847732

Bleich SN, **Wolfson JA**. (2015) Trends in SSBs and snack consumption among children by age, body weight and race/ethnicity. *Obesity*. 23(5):1039-46. PMID: 25919923

**Wolfson JA**, Gollust SE, Niederdeppe J, Barry CL. (2015) The role of parents in public views on how to address childhood obesity in the United States. *Milbank Quarterly* 93:73-111. PMID: 25752351

Smith TJS, **Wolfson JA,** Jiao D, Crupain M, Rangan U, Sapkota A, Bleich SN, Nachman KE. (2015) Caramel Color and Exposure to 4-Methylimidazole in Soft Drinks: A Cancer Risk Assessment. *PLoS-ONE* 10(2): e0118138. PMID: 25693062.

Bleich SN, **Wolfson JA**. (2015) U.S. adult and child snacking patterns among sugar sweetened beverage drinkers and non-drinkers. *Preventive Medicine*. 72C:8-14. PMID: 25584987

**Wolfson JA**, Bleich SN. (2014) Is cooking at home associated with better diet quality or weight loss intention? *Public Health Nutrition,* e1-e10. PMID: 25399031.

Bleich SN, **Wolfson JA**, Jarlenski MP. (2015) Calorie changes in chain restaurant menu items: implications of obesity and evaluations of menu labeling *American Journal of Preventive Medicine.* 48(1):70-5. PMID: 25306397.

Bleich SN, **Wolfson JA**. (2014) Weight loss strategies: Association with consumption of sugary beverages, snacks and values about food purchases. *Patient Education and Counseling.* 96(1):128-34. PMID: 24801411.

**Bleich SN**, **Wolfson JA**, Vine S, Wang YC. (2014) Diet beverage consumption and caloric intake among US adults overall and by body weight. *American Journal of Public Health*, e1-e7. PMID: 24432876.

**Bleich SN**, Vine S, **Wolfson JA**. (2013) American adults eligible for the Supplemental Nutritional Assistance Program consume more sugary beverages than ineligible adults. *Preventive Medicine*. 57(6):894-9. PMID: 24128951.

## MANUSCRIPTS UNDER REVIEW

**Wolfson JA**, Graham DJ, Bleich SN. Attention to physical activity-equivalent calorie information on Nutrition Facts Labels: An eye tracking investigation.

Jarlenski MP, **Wolfson JA**, Bleich SN. Recent trends in nutrient composition of menu offerings in large fast-food chains in the U.S.

Bleich SN, **Wolfson JA**. Differences in consumer use of food labels by weight loss strategies and demographic characteristics.

## OTHER PUBLICATIONS

Bleich SN, **Wolfson JA**, Jarlenski MP. Indirect effects from menu labeling can improve the public's health. *Health Affairs Blog*. Available at: http://healthaffairs.org/blog/2015/02/24/indirect-effects-from-menu-labeling-can-improve-the-publics-health/

**Wolfson JA**, Bleich SN. (2015) Cooking at home is associated with better diet quality. *International Fruit and Vegetable Alliance (IFAVA) Scientific Newsletter.* 100(May 2015):4-4. Available at: http://ifava.org/media/45554/the_ifava_scientific_newsletter_101_-_june_2015.pdf

**Wolfson JA**. Finally, USDA issues new rules on competitive foods in schools. *Center for a Livable Future Blog*. February 12, 2013. Available at: http://www.livablefutureblog.com/2013/02/finally-usda-issues-new-rules-on-competitive-foods-in-schools.

Azrillian J, Kwan A, Linthicum M, **Wolfson JA**. (2012). Evaluation of Corner Store Conversions as a Strategy to Increase Access to Healthy Food. Prepared for the Los Angeles Food Policy Council. Available at: http://goodfoodla.org/resources/publications-research/student-research/

Linthicum M & **Wolfson JA**. (2011). Foodshed/System Assessment: Report to the Good Food Economy Working Group of the Los Angeles Food Policy Council. Available at: http://goodfoodla.org/resources/publications-research/student-research/

## PRESENTATIONS

Poster Presentation. Preventing childhood obesity through an integrated school-based nutrition and physical activity intervention among fourth through sixth grade students in Chicago Public Schools. Presented at the American Public Health Association Annual Meeting in Chicago, IL. November, 2, 2015.

Podium Presentation. An integrated school-based nutrition and physical activity intervention in Chicago Public Schools. Presented at the American School Health Association Conference in Orlando, FL. October 16, 2015.

Podium Presentation. What does cooking mean to you?: Perceptions of cooking and factors related to cooking behavior. Paper presented at the Bridging the Past, Cultivating the Future: Exploring Sustainable Foodscapes hosted by the Association for the Study of Food and Society(ASFS) and the Agriculture, Food and Human Values Society (AFHVS) at Chatham University. Pittsburgh, PA. June 26, 2015.

Podium Presentation. Is cooking at home associated with better diet quality or weight loss intention? Paper presented at the American Public Health Association Annual Meeting in New Orleans, LA. November 17, 2014.

Podium Presentation. Is cooking at home associated with better diet quality or weight loss intention? Paper presented at the Collaboration and Innovation Across the Food System Conference hosted by the Association for the Study of Food and Society(ASFS) and the Agriculture, Food and Human Values Society (AFHVS) at University of Vermont. Burlington, VT. June 20, 2014.

Podium Presentation. Is cooking at home associated with better diet quality or weight loss intention? Paper presented at the 8th Annual Future of Food and Nutrition Graduate Student Research Conference at the Friedman School of Nutrition Science & Policy at Tufts University. Boston, MA. March 29, 2014.

Podium Presentation. The role of parents in Americans' views on how to address childhood obesity. Paper presented at the RWJF Health Eating Research 8th Annual Grantee Meeting. Chapel Hill, NC. February 27, 2014.

## INVITED TALKS

Podium Presentation. Did you cook that? Understanding the meaning of cooking and the implications for promoting and measuring cooking behavior. Cooking & Health Scientific Symposium. Basque Culinary Center. San Sebastian, Spain. November 24, 2015.

Podium Presentation. "Chefs as Catalysts for Change: How Chefs can Support a More Sustainable Future" Food Day 2013: Chefs as Catalysts for Change Conference. Washington, DC. October 21, 2013.

## AD-HOC REVIEWER

*Advances in Nutrition*
*American Journal of Preventive Medicine*
*Health Affairs*
*Pediatrics*
*Preventive Medicine*
*Public Health Nutrition*

## HONORS AND AWARDS

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|---|---|
| 2012-2016 | Center for a Livable Future-Lerner Fellow, Johns Hopkins University |
| 2013-2016 | Johnson & Johnson Community Health Care Scholar, Johns Hopkins University |
| 2010-2012 | Dean's Merit Scholarship, University of Southern California |
| 2012 | Biller Award for Most Outstanding Practicum Project, University of Southern California |
| 2012 | Dean's Certificate of Merit, given to the top 5% of graduating Masters students, University of Southern California |
| 2011 | Academic Capstone Student Exhibit Award, for a policy memo on the Los Angeles Fast Food Moratorium, University of Southern California |
| 1997-2001 | Gallatin Metropolitan Scholarship, New York University |
| 2001 | Leo Bronstein Homage Award, given by the Leo Bronstein Homage Endowment at Gallatin to a student whose work follows in the spirit of this great scholar/teacher, New York University |
| 2000 | NYU Community Service Grant, New York University |

## TEACHING EXPERIENCE

***Johns Hopkins Bloomberg School Of Public Health:***

Department of Health Policy and Management, Summer 2015
*Tools for Public Health Practice* (online course, Prof. Beth Resnick)
Teaching Assistant. Collaborated with instructor and TAs to develop syllabus and course assignments. Graded assignments and participation. Managed the course website.

Department of Environmental Health Sciences, Winter 2015
*Baltimore Food System: A Case Study of Urban Food Environments* (Prof. Roni Neff)
Teaching Assistant. Collaborated with instructor to refine syllabus and assignments. Led 2 course sessions consisting of lecture and discussion. Coordinated guest speakers and course fieldtrips. Graded assignments and participation. Managed the course website and discussion board.

Department of Health Policy and Management, Fall 2014
*Formulating Policy: Strategies and Systems of Policymaking in the 21st Century* (Prof. Shannon Frattaroli)

Lead Teaching Assistant. Collaborated with Professor to develop the course and assignments. Held office hours and mentored students on final policy memo assignments. Graded assignments and participation. Managed the course website and discussion board.

Department of Health Policy and Management, Fall 2014, Fall 2013 & Winter 2014
*Clinic for Public Health Law & Policy*, (Profs. Stephen Teret, Joanne Rosen)
Teaching Assistant. Small, seminar style course modeled after a law school clinic. Worked with faculty teaching team to lead a small group of students in a practical learning exercise of using the law to address public health problems. Issues addressed by the clinic include: Caffeine in junk foods, use of experimental drugs in state executions, and new technology to prevent drunk driving.

Department of Health Policy and Management, Fall 2014
*Policy Communications I: Reading, Writing and Talking About Policy*, (Profs. Shannon Frattaroli & Carey Borkoski)
Lead Teaching Assistant. Collaborated with instructors and TA team to design new sequence for the departmental core policy courses. Collaborated on syllabus and assignments and in class activities. Graded assignments and held office hours with students. Managed the course website and discussion board.

Department of Health Policy and Management, Fall 2014
*Issues in Injury and Violence Prevention*, (Prof. Jon Vernick)
Teaching Assistant. Managed the course website. Led in-class activities and facilitated group discussion. Graded midterm and final exam.

Department of Health Policy and Management, Summer 2014
*Introduction to Bioethics in Public Health Practice and Research*, (online course, Prof. Nancy Kass)
Grader. Graded final exams for online course of 250 students.

Department of Health Policy and Management, Winter 2014
*Public Health and the Law*, (Prof. Jon Vernick)
Lead Teaching Assistant. Managed course website. Graded final exams.

Department of Health Policy and Management, Fall 2013
*Health Policy 2: Public Health Policy Formulation*, (Profs. Shannon Frattaroli & Stephen Teret)
Teaching Assistant. Managed course website, and advised students during office hours about course content assignments. Graded assignments and participation.

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Department of Environmental Health Sciences, Fall 2013
*Food Production, Public Health and the Environment*, (online course, Profs. Robert Lawrence & Keeve Nachman)
Lead Teaching Assistant. Managed course website and graded assignments for large online course. Collaborated with course instructors and TAs to conduct online discussions.

***University of Southern California:***

Price School of Public Policy, Fall 2011 & Spring 2012
*Public Policy and Planning Analysis*, (Profs. Gary Painter and Jenny Schuetz)

Teaching Assistant. Undergraduate class. Graded midterm and final exams. Advised and tutored students during office hours.

Price School of Public Policy, Fall 2011
*Government and Business*, (Prof. Elizabeth Graddy)
Teaching Assistant. Undergraduate class. Graded midterm and final exams. Advised and tutored students during office hours.

## PROFESSIONAL MEMBERSHIPS AND SERVICE

Student Member:
American School Health Association
American Public Health Association
Association for the Study of Food and Society

2013-2015 Student representative on the Academic Policy and Admission Committee (APAC), Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health.

## ADDITIONAL INFORMATION

Computer Skills: STATA; HyperResearch; GIS; InDesign; Microsoft Office Suite
Languages: Proficient in Spanish